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THE RISING TIDE.

THE MADEIRA ISLANDS

BY

ANTHONY J. DREXEL BIDDLE

FELLOW OF THE AMERICAN GEOGRAPHICAL SOCIETY; DELEGATE, BY SPECIAL APPOINTMENT, OF THE ASSOCIAÇÃO COMMERCIAL OF FUNCHAL, MADEIRA, TO THE INTERNATIONAL COMMERCIAL CONGRESS IN PHILADELPHIA, U.S.A., 1899

VICE-PRESIDENT FOR MADEIRA OF THE ADVISORY BOARD OF THE PHILADELPHIA COMMERCIAL MUSEUM

AUTHOR OF "THE BIRTH OF THE NATION," "THE LIFE OF ANDREW JACKSON," "LA BELLE FRANCE," "THE FLOWERS OF LIFE," "A BIOGRAPHICAL ROMANCE," ETC., ETC.

Volume III

WITH TWENTY-TWO FULL-PAGE ILLUSTRATIONS; MAPS OF MADEIRA SHOWING DISTRICTS DEVOTED TO VINE-CULTURE, AND THE MOUNTAINS AND THEIR HEIGHTS; AND FAC-SIMILES OF OLD BILLS OF LADING

AND TREATING OF

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Contents of Volume II

PART IV

The Geography and Geology

CHAPTER XIV

THE GEOGRAPHY AND GEOLOGY

	PAGE
Volcanic Formation—Situation of the Madeiras—The Time —Size of Madeira—Snow—Lava—Coast Conformation— Cabo Girão, the Second Highest Sea-Cliff in the World— Quarries of Cantaria, Building-Stone—Geraniums, Broom, Cactus, and Prickly Pear—Air-Holes and Caverns—Tide —The Inhabited Islands—Porto Santo—Ilheo de Baixo —Lime-Kilns of Funchal—Land-Shells Peculiar to Porto Santo—Life at Porto Santo—Local Steamship Service— The Desertas—The Salvages	17

CHAPTER XV

ALTITUDES

A Table of Heights	31
------------------------------	----

Contents of Volume II

CHAPTER XVI

CLIMATE

	PAGE
Climatic Situation—Humidity—Northeast Trade-Wind—The Leste—Preparations against the Wind-Storm—Sand from the Desert of Sahara—A Danger to Life—Havoc wrought by the Leste—Duration of the Storm—Rain—Clouds—Air—Warning to the Invalid—The Story of an Invalid—Mr. Ootoman's Identity—Health, and how to keep it . . .	35

PART V

The Flora

CHAPTER XVII

AGRICULTURE, AND VEGETABLE RAISING

Irrigation—Levadas—The Opening of the Sluices—Vegetable Products—Pigs, and the Position they occupy in the Peasant's Household—Another Staple Vegetable Food—Leguminous Plants—Ribeiros—A Freshet—Water-Spout and Flood of 1803	49
---	----

CHAPTER XVIII

FRUITS

Varieties of Fruit—Guava—Pineapple—Citron—Opuntia—Date-Palm—Banana—Fig—Apple and Quince—Loquat—Custard-Apple	61
--	----

CHAPTER XIX

FLOWERING PLANTS

Geranium—Alexandrian Laurel—Madeiran Pride—Himalayan Rose—Saxifraga Maderensis—Yellow Violet—List of Luxuriant Flowering Plants	66
---	----

Contents of Volume II

CHAPTER XX

TREES

	PAGE
Camping in the Mountains—Trees—Papaw—Juice makes Meat Tender—Chestnuts—Fuel	77

CHAPTER XXI

FERNS

Ferns like Trees—An Alphabetical List of Ferns growing in Madeira	85
--	----

CHAPTER XXII

MOSESSES

Mosses Peculiar to Madeira—List of Mosses	93
---	----

PART VI

The Vine and the Wine

CHAPTER XXIII

THE VINE AND THE WINE

Introduction of the Vine—History of Good Wine as shown in the Life-Work of Francis Newton—Quantity of Madeiran Wines consumed by the World, Year by Year, since 1774—When the Wine first became Famous—When the Demand exceeded the Supply—The Responsible Wine-Merchants of Madeira—Vines and Stores of Cossart, Gordon & Co.—The Estufa Stores, where the Wines are subjected to Heat—Wine-Making Grapes described—Verdelho—Tinta—Malvazia, or Malmsey—Bual—Serrial—Verdelho, the King of Wine-Producing Grapes—Cossart, Gordon & Co.'s Book—Wine-Making described

Contents of Volume II

	PAGE
by Henry Vizetelly—The Serrado Stores—Coopers—The Season for a Freshet—The Flood of 1803—Shade for the Labourers—Scarlet Geraniums—When the Produce of a Vineyard is Purchased—Racking and Lotting of Wine—Fining for the Pateo Stores—Where the Sun is used instead of the Estufa—Wine sent on a Sea-Voyage to Mature—Precautions against Leakage under Heat—The Risky Proceeding of Tapping Wine in Air-Tight Compartments—Loss of Wine through Evaporation—The Counting-House—The Pateo Stores, where certain Specialties are kept—Where the Choice Wines are Stored—The Oldest Wines—Flavouring and Colouring Wines of Inferior Quality—Light, Tasty, Moderate-Priced Wine .	103

PART VII

The Fauna

CHAPTER XXIV

ANIMALS

Rabbits—Wild Animals—Cattle-Raising—Beasts of Burden—Horses and their Care—Wool-Growing—The Domestic Fowls—Turkey-Time—Business Hours—Slaughter-Houses—The Time for a Siesta—The Time for Social Intercourse	133
--	-----

CHAPTER XXV

THE ORNITHOLOGY

The Canary—The Petrel—The Meadow Pipit—Birds Procreating in Madeira	151
---	-----

Contents of Volume II

CHAPTER XXVI

ICHTHYOLOGY

	PAGE
Animal-Flowers and Shell-Fish—Fresh-Water Fish—Fish a Staple Food—Tunny—Whitebait—Octopus—Best Table- Fish—Marine Varieties of Fish	160

CHAPTER XXVII

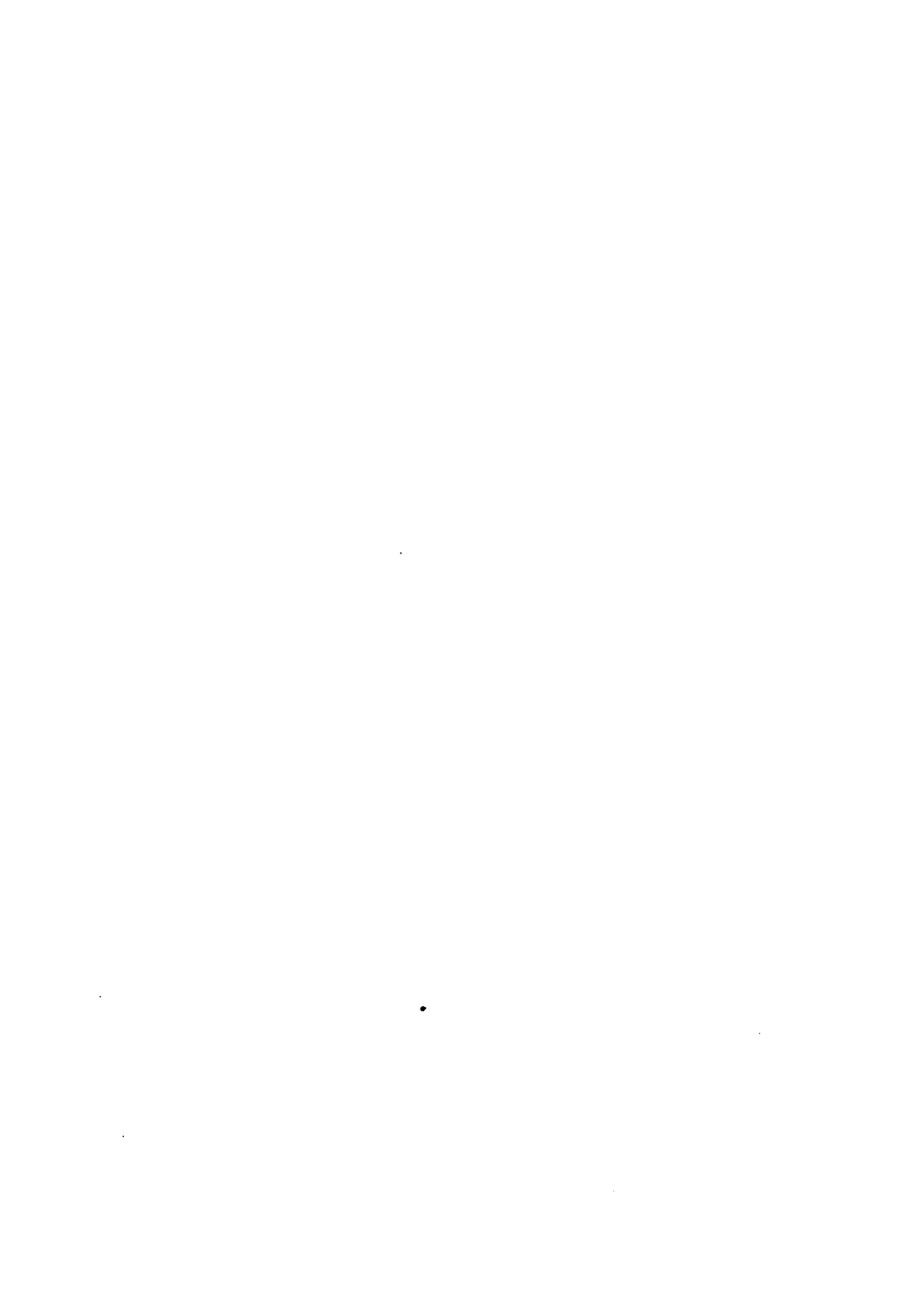
REPTILES AND BATRACHIANS

There are no Snakes—Turtles—Turtle-Soup—Lizards—Batra- chians	166
--	-----

CHAPTER XXVIII

INSECTS

Number of Varieties of Insects—Spiders—Tarantulas—The House-Ant—The Helpless Beetle—Cockroach and Cricket —Butterflies and Moths—Beetles, Grasshoppers, and Lo- custs—List of Insects	173
INDEX	177



List of Illustrations to Volume II

	PAGE
THE RISING TIDE <i>Frontispiece</i>	
CABO GIRÃO	opposite 21
CACTI PLANTS	" 22
PONTA DELGADA FROM SÃO JORGE	" 25
MAP OF THE ISLAND OF MADEIRA	" 35
THE INVALID'S DELIGHT, A HOTEL GARDEN	" 43
BOM SUCESSO WATERFALL	" 49
A FARM	" 50
SCENE IN FUNCHAL—A RIBEIRO	" 54
RIBEIRO FRIO BRIDGE	" 58
A GROVE OF BANANA-TREES	" 62
HYDRANGEA HEDGE AT SANTA ANNA	" 66
A FLOWER GARDEN	" 70
TREES ALONG A COUNTRY ROAD	" 77
TREES IN THE NEW PUBLIC GARDENS	" 78
A NATURAL FERNERY	" 85
MAP OF THE ISLAND OF MADEIRA, COLOURED TO SHOW DISTRICTS DEVOTED TO VINE-CULTURE	" 103
FAC-SIMILE OF AN OLD BILL OF LADING, HEAVY SHIP- MENT FOR AMERICA, DATED MAY 29, 1780	" 104
VINE-GROWING IN THE INTERIOR	" 107
FAC-SIMILE OF AN OLD BILL OF LADING, HEAVY SHIP- MENT FOR AMERICA, DATED JUNE 20, 1780	" 108
FAC-SIMILE OF AN OLD BILL OF LADING, WINE SUP- PLIED TO THE BRITISH NAVY, DECEMBER 21, 1793	" 111

List of Illustrations to Volume II

	PAGE
WAYSIDE GRAPE-VINES	opposite 114
THE VINTAGE AT BLANDY'S	" 120
VINE-GROWING IN THE SUBURBS	" 124
THE OXEN ARE GUIDED BY THONGS ATTACHED TO THEIR HORNS	" 137
THE BEACH AT SUNRISE	" 143
A BUTCHER AND HIS VICTIM	" 144
THE SLACK OF BUSINESS	" 147
LAZY NOONDAY IN THE METROPOLIS	" 148
WHERE BRIGHT-PLUMAGED BIRDS DWELL	" 151
ABOVE THE CLOUDS, WHERE THE BUZZARD DWELLS	" 155
A BEACH AT LOW TIDE	" 160
THE VINEYARD, WHERE THE LIZARD IS DREADED	" 169
WHERE FROGS INHABIT	" 170

Part IV

The Geography and Geology

The Madeira Islands



CHAPTER XIV

THE GEOGRAPHY AND GEOLOGY

Volcanic Formation.—The Madeiras—*i.e.*, Madeira proper, Porto Santo, and the Desertas—rise from the depths of the Atlantic Ocean as the summits of vast mountains built up ages ago by mighty volcanic upheavals and outpourings.

Situation of the Madeiras.—The group is situated in north latitude $32^{\circ} 43'$ and west longitude 17° , at a distance of thirteen hundred and thirty miles from Southampton, five hundred and thirty miles from Lisbon, and three hundred and twenty miles from the north African coast.

The Time.—The time at the Madeiras is one hour, seven minutes, and forty seconds later than at Greenwich.

Size of Madeira.—It is said that Queen Isabella once asked Columbus to give her some idea of the

The Madeira Islands

Island of Jamaica, and the explorer taking a piece of paper crushed it and then opened it out. "This," said he, "will give your Royal Majesty a better description than any which I might be able to tell you." Such an apt notion may answer well to describe the geographical conformation of the island of Madeira, which is thirty miles in length and twelve miles in breadth.

Snow.—The island shows a central ridge of mountains running from east to west, its loftiest summits—those from five thousand five hundred to six thousand feet high—often covered with snow.

Lava.—There are a few ancient lava cascades in the mountainous districts of Madeira proper, near the southern coast. At Porto Moniz there is a remarkable islet some two hundred feet in height on a base of basalt. This island is a dwelling-place for sea-fowl; its steep sides are inaccessible to humanity. At Porto Moniz a great stream of lava at one time flowed over the cliffs into the ocean; this stream has left a solid mass that now forms a reef nearly fifteen hundred feet beyond the coast line. Many of the peasants in this district live comfortably in cavities cut into the



CABO GIRÃO.

Geography and Geology

tuff. As has been elsewhere stated, Madeira was, in countless ages gone by, a mass of eruptive volcanoes, and there is still much lava to be found in the mountain fastnesses and in the valleys.

Coast Conformation.—The coast abounds with objects of interest for the naturalist and for every lover of nature in her wildest and most sublime aspects. Mountains are precipitous at the water's edge and beaches are infrequent. Sea-cliffs rise sheer to heights varying from five hundred to nearly two thousand feet, their bases bathed with foam and their summits crowned with clouds.

Cabo Girão, the Second Highest Sea-Cliff in the World.—To the west of Funchal towers Cabo Girão, the loftiest sea-cliff of Madeira, and with the exception of one on the coast of Norway the highest in the world. Rising almost perpendicularly, Cabo Girão reaches an altitude of nineteen hundred and thirty-four feet above the water.

Quarries of Cantaria, Building-Stone.—On the face of this gigantic cliff are quarries of cantaria,¹ hard grayish stone much used in building.

¹ Chapter IX., Masonry.

The Madeira Islands

It is stated in Chapter II. (paragraph headed Cabo Girão) that Zargo, after leaving Funchal, proceeded three miles to the westward and came before a mighty precipice, which he named Cabo Girão. It is now only two miles distant from Funchal, the city having enlarged a mile westward since it was originally founded.

Geraniums, Broom, Cactus, and Prickly Pear.

—The almost perpendicular sides of the sea-cliffs are often covered with wild geraniums,¹ broom, cactus, and prickly pear. At infrequent intervals along the coast the ever-beating waves have broken a rocky prominence and have ground the fragments together during countless high tides until shores have been built of their crumbings. In such places rocks tower from the water in chaotic confusion, in the shape of church-spires, which rear their points to great heights, or in mountainous masses. During times of storm, when the sea runs high, water is seen spurting far up on the promontories.

Air-Holes and Caverns.—The spray is thrown up from mysterious air-holes, through which it

¹ Chapter XIX., Flowering Plants.



CACTI PLANTS.



PONTA DELGADA FROM SÃO JORGE.

Geography and Geology

seethes with hissing, booming, and groaning noises that are weird and awe-inspiring to the unfamiliar hearer. Entrances to caves appear in the rocky coast walls, and many of the caverns are long, winding, and high vaulted.

Tide.—The tidal wave¹ strikes the Madeiras at about the same time that it arrives at the Azores, and high water occurs at the time of the full moon or of the new (or change) at ten minutes before one o'clock in the afternoon. The measure of the ebb and flow of the tide is seven feet, and the flood runs at nearly a mile and three-quarters an hour on springs, N. 30° E.

The Inhabited Islands.—Of the four principal islands and groups of islands which form the Madeiras, or Madeiran group, but two are inhabited. They are Madeira and Porto Santo. The uninhabited groups are the Desertas and the Salvages.

Porto Santo.—Porto Santo lies about twenty-three miles northeast of Madeira. It is six and one-third miles long and from two to three miles across. Its geology is of the same general volcanic character as that of Madeira.

¹ Chapter XVI., Climatic Situation.

The Madeira Islands

Ilheo de Baixo.—From a great deposit of coral limestone in the Ilheo de Baixo, an islet off the southwest coast of Porto Santo, is derived the entire supply of lime used in Madeira. The stone is quarried in horizontal galleries, one of which extends across the islet.

Lime-Kilns of Funchal.—The calcic rock is shipped to Funchal, where it is burned into lime in kilns situated near the Leper Hospital of São Lazaro.¹ The Ilheo de Baixo is an old coral reef, with an average elevation of two hundred feet above the ocean and a peak some five hundred and eighty feet in height.

Land-Shells Peculiar to Porto Santo.—There are several varieties of land-shells to be found along the coast of Porto Santo which are peculiar to that island, and which are, therefore, of special interest to the visiting geologist.

Life at Porto Santo.—Although Porto Santo was, as already mentioned,² the first island of the Madeira group discovered, and was settled more than four centuries ago, its population to-day

¹ Chapter VII., Leprosy and the Leper Hospital.

² Chapter II., Discovery and Naming of Porto Santo.

Geography and Geology

numbers all told scarcely two thousand persons. Nearly all of these live in the one and only town, Villa Baleira, where an administrator resides, who rules over this stationary population.

While referring to the community of Porto Santo the writer cannot desist from quoting a paragraph descriptive of the stagnant life on that island.¹ The clever observations made by Mr. Bowdich in Porto Santo three-quarters of a century ago are equally applicable to the state of affairs existing there at the present day. The paragraph runs as follows :

“The white sandy beach of Porto Santo seemed to promise me a different geological field for observation to that of Madeira, and I was all impatience to get ashore ; but it was necessary that I should have the governor’s permission to do so, which the captain of the boat was despatched to procure ; for the economical nature of the government did not permit any Mercury to be in attendance for this purpose ; and, indeed, during the three days I resided there I could never discover that the governor had more than one king’s servant under his command, for all the purposes of ordinary state, and he (distinguished

¹ Excursions in Madeira and Porto Santo during the Autumn of 1823, by the late T. Edward Bowdich.

The Madeira Islands

by being clothed in tattered remnants of various uniforms) opened the gates, hoisted the flag, beat the drum at sunrise and sunset, swept the yard, helped in the kitchen, and waited at table when the governor had company. I should mention that the governor himself, a major in the army, has only six hundred dollars a year from the government, depending for anything more on his own ingenuity. The captain of the boat tied his better suit of clothes in a handkerchief, which he held on the top of his head, and, plunging into the water, swam ashore; but, although he quitted us at seven o'clock, it was thought derogatory by the governor's servant to acknowledge that his excellency had risen until nine, and then he must breakfast before he could grant the audience; in which he graciously permitted us to come ashore, in a place where there seemed nobody but himself and the drummer to prevent us. The landing is almost as bad as that at Funchal. I begged to wash myself before I proceeded to the governor's, and was bowed into a stable and furnished with a decanter of water, not as the most convenient, but as the most splendid vessel that could be immediately laid hold of in the neighbourhood. The governor's house looked like that of the lawyer in a small village in England; it was very neat, of one story, and contained but two sitting-rooms, one of which, however, was spacious and very comfortably furnished. A row of cannons (some of which had fallen from their carriages, whilst the others, from their monstrous touch-holes and rusty condition, were emblems of peace rather than war, and fit

Geography and Geology

subjects for a society of antiquaries) adorned the turf before the house, and a second row, in sufficiently good condition for the gunner or drummer to fire a salute with some safety, was ranged in the yard. We were given to understand that we should find the governor in his library, which proved to be a small room level with the court, adorned with about a dozen books, the drum, some old maps of Sanson and Jansens (more useful for giving an idea of the history than of the actual state of geography), and some rude drawings of his son's, a genteel, smart boy, about thirteen years of age. His excellency was hard at work in a cotton jacket, writing despatches to Madeira, the unexpected appearance of our boat having flattered him with the rare opportunity of communicating the unchangeable state of things in Porto Santo to his superior. He received me with the greatest politeness, and begged me to believe that both he and his house were at my service, and sending for the commandant (an old man of seventy, distinguished by a red edging to his great coat), charged him to order one of the most intelligent of the better class of peasantry, on his allegiance as a militiaman, to accompany and direct me in my rambles through the island."

Local Steamship Service.—The only communication which these literally "insular" people of Porto Santo have had until recently with the outside world has been by a single small coasting

The Madeira Islands

steamer, the *Falcão*¹ (Falcon), which plied between Madeira and Porto Santo twice every month, conveying the mails and affording a means of transportation for not exceeding forty passengers. A larger steamer has recently been built for service to the north coast of Madeira and to Porto Santo.

The Desertas.—The Desertas, about ten miles southeast of Madeira, comprise three towering rocky islands. Deserta Grande, the largest, towers out of the sea to a height in some places of over sixteen hundred feet. It varies from half a mile to a mile in width, and is about six miles long.

The Salvages.—The Salvages, another group of three islands, lie about one hundred and fifty-six miles from Madeira and between Madeira and the Canaries. The largest of the Salvages is the Great Piton, a mile in width by three miles in length.

¹ The *Falcão* is described in Chapter VIII., By Steamer to Santa Cruz.

CHAPTER XV

ALTITUDES

A **Table of Heights.**—The following table gives in English feet the heights above sea-level of the principal mountains and localities of interest in the Madeiran group.

<i>Madeira</i>	
Deanery	300
Quinta do Val	350
Levada de Santa Luzia	500
São Jorge	1069
Santa Anna Hotel	1090
São Roque Church	1129
Mirante Vista do Machico	1769
Portella Pass	1799
Palheiro	1800
Penha d'Águia	1915
Cabo Girão	1934
Mount Church	1965
Church in the Curral das Freiras	2000
Church at Camacha and Santo Antonio de Serra	2300
Mr. Veitch's house at Jardim da Serra	2526
Levada in Ribeiro Frio and Ribeira da Metade	3000
Pico da Cruz Campanario	3071

The Madeira Islands

Pico dos Bodes	3725
Pico do Arrebentão	3844
Encumiada de São Vicente	4000
Pico da Lagôa	4762
Pico Ruivo on the Paül da Serra	5210
Pico Grande	5391
Pico Arrieiro	5893
Pico das Torrinhas de Boa Ventura	5980
Pico das Torrinhas (or Torres) do Poizo	6000
Pico Ruivo	6056

Desertas

Sail Rock, off north end of Ilheo Chão	160
Ilheo Chão	336
Bugio	1349
Deserta Grande	1610

Porto Santo

Ilheo de Cima	364
Ilheo de Baixo	570
Pico d'Arma Ferreira	911
Pico Branco	1389
Pico do Castello	1446
Pico do Facho	1663

CHAPTER XVI

CLIMATE

Climatic Situation.—Situated between the isothermals of 64° and 68° F., the climate of the Madeira Islands is marked by a singular uniformity of temperature. It is stated by certain scientists that this is due in great part to its position in the midst of the ocean, whence its atmosphere is at all times drawing a supply of aqueous vapours.

Humidity.—On account of the warm current¹ that flows by it, there is a much larger quantity of moisture in the air of Madeira² than there would otherwise be. Dr. Tyndall, an English scientist, shows that the water suspended overhead as vapour protects the earth in the same way that warm clothing protects the body, at one time arresting the heat rays of the sun and again lessening the radiation of heat from the earth into space. The

¹ Chapter XIV., Tide.

² Chapter VII., Where the Rêde is Desirable.

The Madeira Islands

atmosphere of England contains, on an average, but one particle of water to two hundred particles of air, but that one particle absorbs eighty times as much heat as the collective two hundred air particles.

Northeast Trade-Wind. — From April 10 to September 10 the northeast trade-wind blows on Madeira, but during the winter season the island is some four degrees beyond the limits of the trade-wind, though the prevailing wind, which blows irregularly, is even then from the northeast. Occasionally in the spring the north wind blows over the central ridge of mountains and rushes down its slopes, causing damage to the vineyards.

The Leste. — The warm, dry east wind, which blows from the African desert in summer-time, and in Madeira is known as the "*leste*," is the same wind which in southern Europe strikes hot and cold in various places. In Switzerland, for instance, the African wind, there called the "*bise*," is a cold, icy wind; this is because, while blowing across the peaks of the lofty Alps, which are perpetually covered with snow and ice, it loses all its heat and sand. Indeed, when it pours down into a Swiss valley it sends a chill through every one on the

Climate

hottest and most sunshiny day in summer. It is when an unusually violent east wind sweeps over the great Desert of Sahara that its effects are seriously felt in the Madeira Islands, although they are distant some three hundred and twenty miles from the African coast.¹ But, strange as it may seem, the hot sand is caught up from the desert in swirling wind-clouds and thus conveyed, through the azure heights of the upper air, across the sea to the Madeira Islands; it is also thus carried to the Canaries.

Preparations against the Wind-Storm.—In Madeira, when such a storm appears, far out at sea and coming onward, as it does, with great velocity, the islanders hastily leave everything and betake themselves to their homes. They there remain until the storm passes, for it always wreaks havoc.

Sand from the Desert of Sahara.—Damp cloths are hung over every window and aperture in the houses, for from the mighty wind-clouds burning sand pours down upon the land, scorching all verdure and foliage and filling every nook and crevice with hot, fine, sandy particles.

¹ Chapter XIV., Situation of the Madeiras.

The Madetra Islands

A Danger to Life.—To venture out in such an atmosphere as prevails during this storm means possible death ; for the air is burning hot and impregnated with sand, which, if inhaled, is like a deadly poison to the lungs. Besides causing suffocation, it often burns and destroys the lung tissue.

Havoc wrought by the Leste.—After the sand-storm, which occupies anywhere from a couple of hours to three days in passing, destruction is found in the most unlooked-for places. Aside from the fact that promising crops are withered and destroyed, great holes are burned through heavy hedges, and the leaves and smaller branches on the sides of trees exposed to the hot storm's violence are scorched to crumbling dryness.

Duration of the Storm.—Numbers of aged and weak people die in the islands during an unusually prolonged or especially hot and violent sand-storm. Fortunately, the storm does not occupy *usually* more than two or three hours in sweeping across the islands.

Rain.—At the end of summer the equinoctial rains, accompanied by much lightning and little thunder, set in. The average rainfall, taken from seventeen years' observations, has been found to be

METEOROLOGICAL OBSERVATIONS.

FUNGHAL, MADHRA.		October.	November.	December.	January.	February.	March.	April.	May.	No. of Years of Observations.
Temperature, shade, mean of, mean daily	Degrees F.	68.6	65.0	61.8	60.3	60.3	60.8	62.4	64.4	25
Temperature, shade, minimum, mean daily	Degrees F.	63.9	60.5	57.3	55.7	55.1	55.2	57.6	59.6	19
Temperature, shade, range, mean daily	Degrees F.	9.9	9.8	9.3	9.5	10.0	9.9	9.4	9.2	19
Moisture of atmosphere, relative humidity, mean daily	Sat. 100.	66.0	68.3	68.2	69.0	66.0	63.4	65.9	65.5	19
Rain, amount of, mean monthly	Inches.	2.30	4.78	4.10	4.58	2.64	2.88	1.75	1.07	19
Rain, number of days on which rain fell (.01 of an inch or more), mean monthly		8.7	10.0	10.7	12.0	6.7	8.4	7.0	5.7	11

By adding the mean daily range to the mean minimum the mean maximum can always be found.

Climate

The Madeira Islands

26.71 inches. The foregoing table of meteorological observations¹ gives a concise idea of the atmospheric characteristics of the Madeiran climate.

Clouds.—While the rainfall in Madeira is slight and infrequent, there is seldom a cloudless day, the mountain-peaks being constantly bathed in nebulous vapours.

Air.—The air is sedative and conducive to rest, which is an advantage to invalids that come to Madeira suffering from nervous complaints.

Warning to the Invalid.—It may here be said that it is unadvisable for an invalid² to come to Madeira unattended; there have been many sad cases where the dying have had no one at hand to help or understand them.

The Story of an Invalid.—The writer recalls with great pleasure his acquaintance and subsequent friendship with a Russian gentleman suffering from consumption, who was a visitor to the island in 1889. The name by which the gen-

¹ Chapter VII., The Meteorological Observatory.

² Chapter IV., Why Madeira is Especially Interesting to the World; Chapter XIII., A Watering-Place and Health-Resort.



THE INVALID'S DELIGHT, A HOTEL GARDEN.

Climate

tleman was known was Mr. Ootoman, and, like many of the Russian aristocrats, he was highly educated and well-informed. He spoke some eight or ten languages fluently and was a most delightful and entertaining conversationalist. It was a pleasure to meet him, for, though he suffered intensely, he was always bright and cheerful, and his face wore a radiant smile. It was his joy to be wheeled into the garden in a rolling-chair and there to sit among the scented flowers and hearken to the songs of the canaries as they flitted overhead in the bright sunshine. He had lived a highly interesting life, and had penetrated the wilds of China and Siberia and gone through the most thrilling experiences in the interests of his government. It was while thus engaged that he had contracted his deadly malady, and he had come to Madeira accompanied by neither kith nor kin, hopeful that a winter passed in the salubrious climate might restore his former health. But one day the writer, who was accustomed to seek him in the garden, missed him, and on going to his room was met at the door by his faithful attendant, who in a sobbing voice said that his master's spirit had just passed to a brighter and better world. The writer

The Madeira Islands

was one of the few mourners at the funeral. A Russian war-ship called for the remains.

Mr. Ootoman's Identity.—It was discovered that the deceased Mr. Ootoman was none other than a distinguished member of the royal family of Russia. In his case there was a devoted attendant, who knew him in his true capacity, at his bedside when death stole upon him; but many invalids who could well afford a trusty companion come to Madeira unaccompanied, although suffering from dangerous maladies.

Health, and how to keep it.—As was said in Chapter V.,¹ great care should be taken by the well and strong as well as by invalids to avoid violent exercise before becoming acclimated. Discrimination as to diet² and a careful self-watchfulness are earnestly recommended, for in the bright sunshine and scarcely varying temperature the new-comer is tempted to run undue risk.

¹ Chapter V., How to avoid Sunstroke.

² Chapter V., Diet for the New-Comer.

Part V

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The Flora





BOM SUCCESSO WATER-FALL.

CHAPTER XVII

AGRICULTURE AND VEGETABLE RAISING

Irrigation.—Cultivation in Madeira is dependent to a great extent upon irrigation.¹ The scarcity of rain on the island has been mentioned in a preceding chapter. There is a much larger fall of rain in the highlands, however, than in the lower regions. Though there are streams in plenty which seldom become dry, yet the sources of these are up in the mountains, and the water, dashing from towering heights into deep ravines, is difficult to obtain where it is needed.

Levadas.—But here are the *levadas*, a part of Madeira's excellent system of irrigation. Mountain streams are stopped far up near their sources and diverted into these *levadas*,—channels built of masonry or constructed in the solid rock,—which conduct the water to the cultivated lands below, where it is dealt out for a period of several

¹ Chapter XIII., MADERIA IN 1898, Water Supply.

The Madeira Islands

hours on stated dates to the land-owners who have obtained a right to its use.

The Opening of the Sluices.—The opening of the sluices is under the direction of the “leva-deiro,” and great excitement prevails among the agriculturists¹ when the hour at which they may expect their water-supply arrives. Considerable amusement is afforded to the disinterested sight-seer if he be present on such an occasion, for the natives, realizing the short space of time that they have in which to irrigate their fields and fill their water-tanks, seem to lose all self-control at sight of the first gush of water, and dash hither and thither, waving their arms and yelling like madmen. Their apparently frantic conduct and the unsystematic way in which they go about this work are rather remarkable, in view of the fact that the irrigation of their fields is of necessity not a novelty to them.

Vegetable Products.—The staple agricultural product is the grape.² Among the vegetables grown for the most considerable consumption are

¹ Chapter VIII., Farming Country.

² Chapter XXIII., The Vine and the Wine.



A FARM.

Agriculture and Vegetable Raising

the *batata* (common or Irish potato), *inhame* (yam, or Indian potato), and *batata edulis* (sweet potato), the latter yielding three or four crops annually and being highly esteemed as a delicious article of diet.

Pigs, and the Position they occupy in the Peasant's Household.—The leaves of the sweet potato plant are fed to the pigs, which express their gratification over such food in more clamorous grunts than on receipt of the daintiest swill. And the preference of the pig is carefully regarded, for the pig is the poor man's pet. A superstitious belief that it brings fortune to its owner is probably the explanation of the respected position which it occupies as a member of the peasant's household. For it receives various polite attentions and is further honoured by being one day slain, to be served up as a principal dish at some religious celebration,¹ its flesh being on occasions of festivity the prescribed food.

Another Staple Vegetable Food.—*Abobora d'agua* (pumpkin) is also a staple food, and its vine is frequently trained over the straw-thatched

¹ Chapter XII., Fête-Days and Religious Celebrations.

The Madeira Islands

hut of the countryman. *Pepinella* (a variety of cucumber) is also grown extensively, and is in season during the winter months. *Nabo* (turnip) and *cenoura* (carrot) are in season throughout the year, and *couve* (cabbage) and *cebola* (onion) produce several crops annually; the latter, called root-food, attains a high degree of excellence in Madeiran soil and is exported extensively.

Leguminous Plants.—The principal leguminous plants cultivated are *baginha* (French bean), *lentilha* (lentil), *Grão de bico* (chick-pea), *tremoço* (lupine), and *feijoeñ* (haricot-bean). The vegetable last named constitutes an important article of subsistence to the country-folk, who partake of it daily in the form of a *sopa* (soup).

Ribeiros.—It has already been told, in the first part of this chapter, how the *levadas* are made to carry fresh water from the mountain springs to the lowlands for purposes of irrigation. Three mountain streams find their way to the sea through Funchal, crossing the city at different points. They are called *ribeiros*. Their currents are hemmed in on either side by tall, massive walls, the necessity for which is ordinarily not apparent, as the streams appear to be mere brooklets that



SCENE IN FUNCHAL—A RIBEIRO.

Agriculture and Vegetable Raising

dance or trickle along over the stones and pebbles.

A Freshet.—But when an unlooked-for freshet or a rapid melting of the ice in the snowy and cloud-bathed regions fills the mountain streams with water to overflowing, dams constructed near their sources are burst and a roaring torrent descends to the lowlands with force sufficient to carry everything before it.¹ At such a time the necessity for the stone barricade is apparent, for, though it may not overflow its confines, the turbulent current sometimes tears bridges from their fastenings and sweeps them into the sea.

Water-Spout and Flood of 1803.—In the month of October of the year 1803 heavy rains fell on the mountains and a water-spout burst there. It was near the hour of midnight when down the *ribeiros*, which were not walled in then as they are now, came rushing a mighty torrent. Houses were soon surrounded by the surging water and carried out to sea.²

It is related that one of the Portuguese nobility

¹ Chapter XXIII., The Season for a Freshet.

² Chapter XXIII., The Flood of 1803.

The Madeira Islands

had given a grand ball that night and that many great people were in attendance. The nobleman's house, the scene of the entertainment, was lifted clear of its foundations and carried in an upright position on the crest of the rushing water out into the ocean. There for some moments it floated entire, and at the brilliantly illuminated windows the many guests were descried vainly struggling and calling for help. Slowly the building sank beneath the waves and every one was lost.



RIBEIRO FRIO BRIDGE.

CHAPTER XVIII

FRUITS

Varieties of Fruit.—The fruits which grow in the most considerable abundance and excellence are the *banana* (banana), lo-quot, *figo* (fig), *goiaba* (guava), *uva* (grape), *pera* (pear), *pecego* (peach), *maçã* (apple), *maçã ananaz* (pineapple), *damasco* (apricot), *ameixa* (plum), *goiaba* (Cattley guava), custard-apple, *manga* (mango), *pitanga*, alligator or avocado pear, *laranja* (orange), Tangerine orange, *tamara* (date), *limão* (citron), *limo* (lemon), *groselha* (gooseberry), grandillas, Tabiaba and red banana.

Guava.—Of these the guava deserves especial mention, for it is an exceptionally fine fruit, grows to perfection in the Madeiras, and constitutes a staple article of exportation. It is about the size of a peach, has a very rough skin, no stone, but tiny kernels.

Pineapple.—The pineapple, the cultivation of which is now a leading industry, is another de-

The Madeira Islands

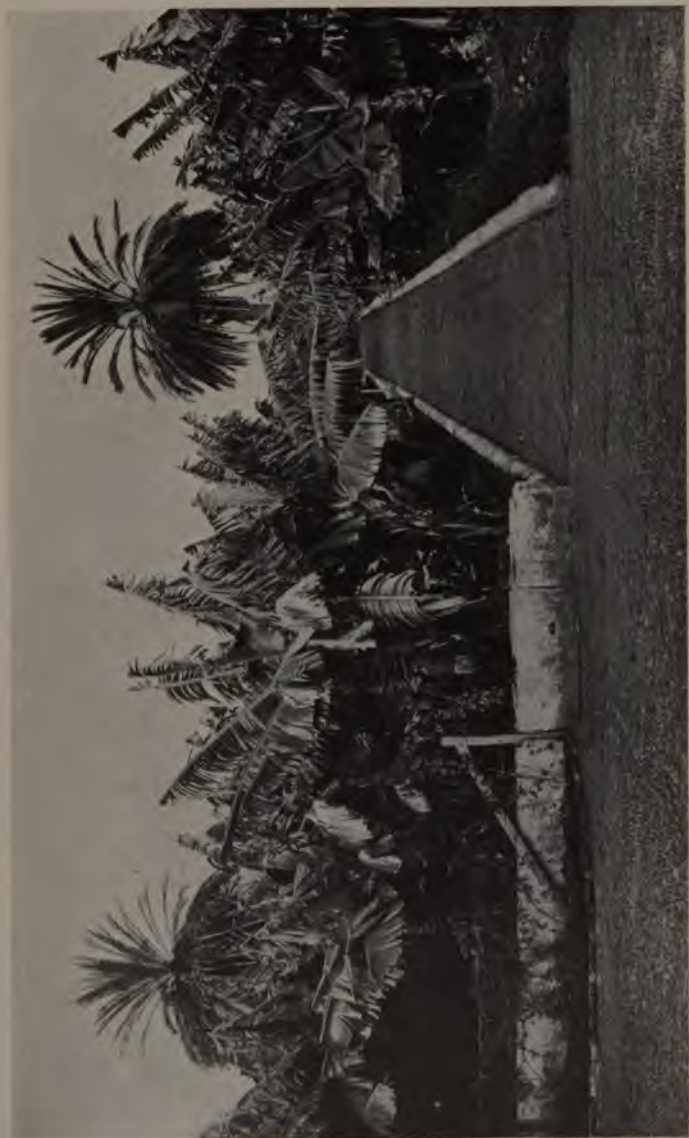
licious fruit that attains a degree of excellence in Madeira unequalled elsewhere, though, oddly, it is not a native product, but has been introduced.

Citron.—The citron, grown for confection, is exported in large quantity.

Opuntia.—The opuntia somewhat resembles the pear, and is a wholesome and nutritious food.

Date-Palm.—Certain botanists have observed that the date-palm grows exclusively in those localities of the world wherein the banana-tree thrives. In Madeira the date-palm attains an average height of forty-five feet and produces bunches of fruit which weigh from fifty to seventy-five pounds each.

Banana.—A banana-tree, which bears fruit all the year round, is from fifteen to twenty feet high. The leaves are large and pendulous. The trunk is usually about twelve inches in diameter, but of so soft and spongy a texture that it may be severed with a single stroke of a heavy blade. The fruit generally grows in two large clusters, comprising from thirty to a hundred bananas in each. When the cluster is gathered, it is necessary to cut off the stalk, as the omission to do so would prevent its bearing again.



A GROVE OF BANANA-TREES.

Fruits

There is an ancient superstition to the effect that the banana is the forbidden fruit of the Bible, and, though lapses of time have put a haze of doubt about this belief, the native is still at pains to break the fruit when eating it, considering it a sacrilege to slice it and thus expose the cross-shaped core.

Fig.—Fresh figs are considered a great delicacy, and a favourite manner of serving them is with cream, a luxury obtainable at no moderate price. The fruit reaches perfection during August and September, and is then gathered for preserving.

Apple and Quince.—Apples and quinces are abundant, but are rather dry and tasteless.

Loquat.—The loquat resembles a small peach, but tastes more like a very ripe persimmon.

Custard-Apple.—Most delicate and toothsome of the many various fruits is the custard-apple.



CHAPTER XIX

FLOWERING PLANTS

Madeira is verily a land of flowers.¹ Mr. T. Edward Bowdich, the famous conductor of the mission to Ashantee in the early part of the present century, visited Madeira while on his third voyage to Africa in the autumn of 1823, and was greatly impressed by the luxuriance of the island's flora. He said, "If Homer's beautiful description of the Phæacian Isle, where fruit succeeded fruit and flower followed flower in rich and endless variety, be applicable to any modern one, it is to Madeira."

At all seasons flowers bud and bloom and the air is full of perfume. Many of the plants which in our northern climates must be grown in green-houses are indigenous to Madeiran soil and flourish to a degree of luxuriance calculated to open wide the eyes of the American or English gardener

¹ Chapter V., Private Gardens ; Chapter VII., Madeiran Horticulture.



HYDRANGEA HEDGE AT SANTA ANNA.

Flowering Plants

who tends the same varieties in their dwarfed and delicate potted¹ state.

Geranium.—Of these the *geranio* (geranium) should be mentioned first, for it riots in untrained profusion in Madeira, growing anywhere and everywhere, as the daisy grows in America. The blossom is as large as the largest chrysanthemum, and the plants attain heights of from ten to fifteen feet. When growing by the side of a wall or of a house the geranium becomes a vine, and quickly spreads its twining branches upward in all directions. Tree-trunks are often enveloped in flowering geranium-vines.

Alexandrian Laurel.—A splendid climber is *Allegre campo* (Alexandrian laurel), and *Sibthorpia prostrata* is a very graceful and luxuriant trailer.

Madeiran Pride.—The *Echium fastuosum* (Madeiran pride) bears large claret-coloured flowers that are very gorgeous.

Himalayan Rose.—Hedges of Himalayan rose are quite popular in the rural districts.

Saxifraga Maderensis.—A pretty white flower grows on the *Saxifraga Maderensis*.

¹ Chapter XXIII., Scarlet Geraniums.

The Madeira Islands

Yellow Violet.—A yellow violet peculiar to Madeira is found in the vicinity of Pico Ruivo,¹ the loftiest mountain summit.

But a full description of the many plants in Madeira which are worthy of mention would fill a volume in itself, or at least would occupy more space than can be spared for it in a work like this of a general character. The following alphabetically arranged list will serve to show the remarkable profusion of flowers that flourish in Madeira.

List of Luxuriant Flowering Plants.—While it has been compiled with great care, it names only the more abundant and luxuriant varieties, as other flowering plants too numerous to mention thrive on the island, but are less plentiful and interesting.

THE LUXURIANT FLOWERING PLANTS.

Acanthus.	Calycanthus.
Allamanda.	Canterbury bells.
Amaryllis, varieties.	Cantua dependens.
Azalea.	Carnation.
Begonia.	Celandine.
Bougainvillea.	Cereus.
Calceolaria.	Clematis.

¹ Chapter VII., Pico Ruivo.



WAYSIDE GRAPE-VINES.



A FLOWER GARDEN.

Flowering Plants

THE LUXURIANT FLOWERING PLANTS—*Continued.*

Clerodendron.	Laburnum.
Coleus.	Lapageria.
Coronilla.	Lavender.
Daffodil.	Lilac.
Dahlia.	Lilies.
Delphinium.	Lobelia.
Dolichos lignosus.	Lychnis.
Eschscholtzia.	Malvaviscus.
Eucharis Amazonica.	Mandevilla suaveolens.
Franciscea.	Marica.
Fuchsia.	Marigold.
Funkia.	Maurandya.
Gardenia.	Mexican vine.
Gazania.	Michaelmas daisy.
Geraniums.	Mignonette.
Gesnera.	Narcissus.
Gladiolus.	Neapolitan violet.
Gloxinias.	Nemophila.
Guernsey lily.	Pentstemon.
Heart's-ease.	Petunia.
Heliotrope.	Pink.
Hoya.	Pleroma.
Iris.	Primrose.
Ixia.	Ranunculus.
Jasmine.	Rhynchospermum jasmi-
Jonquils.	noides.
Justicia.	Rosemary.

The Madeira Islands

THE LUXURIANT FLOWERING PLANTS—*Concluded.*

Roupellia.

Rue.

Salvia.

Solanum.

Sollya.

Sparaxis.

Squill.

Stapelia.

Stephanotis.

Sweetbrier.

Sweet-william.

Thunbergia.

Tradescantia.

Tritoma.



TREES ALONG A COUNTRY ROAD.

CHAPTER XX

TREES

Camping in the Mountains.—When the visitor wearies of the town and its sights there are still the rural districts and villages to be explored,¹ and the wild, rugged, and forest-covered interior of the island to be penetrated. There is nothing more delightful and more exhilarating for those with a love for natural history than to spend some time in the highlands during the summer months. Rambling about from cliff to dell, where the mountain breezes play, in search of new trees, ferns, stones, insects, birds, and shells, is a paradise for the naturalist. It is advisable to have the *rêde* at hand on such a mountain excursion.² A number of enthusiastic naturalists have been accustomed to remain in the mountainous regions as nomads during the

¹ Chapter VIII., Journeys to Distant Points of Interest.

² See Chapter VII., How to dress for Mountaineering; Where the *Rêde* is Desirable.

The Madeira Islands

summer. To such, and to all those who intend to stay for any length of time amidst the lofty hills of the interior, a tent is highly recommended.

Trees.—As already mentioned, there are forests in the interior, but few trees in the vicinity of the coast,¹ except those under special cultivation in gardens and along public boulevards. As the list of trees found thriving in Madeira includes almost every variety common to the world's various climes and soils, it would be useless to append such a list herewith. For where the palm and the fir, the banana and the blackberry, the pineapple and the apple grow in luxuriance side by side it would be difficult to find a plant of any kind languishing on account of unsuitable soil or climate. Some of the fruit-bearing trees are named in Chapter XVIII., in connection with the description of their fruits.

Papaw-Juice makes Meat Tender.—Special mention might, however, here be made of the papaw-tree, which bears a green pear-shaped fruit, the juice of which possesses the property of making tough meat tender. The leaves produce

¹ Chapter IV., The Seven-Years' Fire.



TREES IN THE NEW PUBLIC GARDENS.

Trees

the same result if they are wrapped about such meat for a short time.

Many of the palms are particularly fine: the more abundant varieties are date-palm; *Latania bourbonica* and *Chamærops humilis*, fan-palms introduced from Portugal; and cabbage-palm. *Cycas revoluta*, often though erroneously called sago-palm,—it is not a true palm,—also grows well.

The leading nuciferous trees are the walnut, the oak, and the Spanish chestnut.

Chestnuts.—The natives eat largely of chestnuts, of which there are generally abundant crops. The favourite manner of preparing them is by roasting. Roasted chestnuts occupy a prominent place in all market displays. The leaves of the chestnut-tree are fed to the cattle.

The coniferous specimens include the gray Aleppo pine, the Brazilian pine, the Norfolk Island pine, and several trees introduced from the Canaries and New Zealand.

Fuel.—Pine-forest growing is an industry in the interior. Firewood is worth from nine thousand to ten thousand five hundred reis per sledge-load in Funchal, where it can also be bought in smaller

The Madeira Islands

quantities. *Queima*, heath cut and dried on the serra, is excellent material for kindling fires. It can be used in lesser quantity and is less expensive than larger wood, selling at the rate of from sixteen to twenty pieces per one hundred reis.

Of other trees the more noticeable are the camphor-tree, silk-cotton tree, coral-tree, and India-rubber tree.



A NATURAL FERNERY.

CHAPTER XXI

FERNS

Ferns like Trees.—There are several varieties of fern that bear a close resemblance to trees, on account of the remarkable heights which their fronds attain. During the writer's residence in Madeira he made a collection of many of the indigenous ferns, but before undertaking to compile a list of the varieties he carefully studied the existing lists in the botanical library of the British Museum, and furthermore consulted, during the preparation of his list, valuable published works, from which he received considerable assistance, and which he takes pleasure in mentioning. They are "The Synopsis Filicum," a comprehensive and thorough treatise, by the Messrs. Baker and Hooker; the "List of Indigenous Ferns," compiled by the world-famous botanist Mr. J. Y. Johnson; and the excellent book on Madeira written in German by Dr. Mittermaier, of Heidelberg.

The Madeira Islands

AN ALPHABETICAL LIST OF FERNS GROWING IN MADEIRA.

SCIENTIFIC NAME.

DESCRIPTION.

ACROSTICHEÆ.

- Acrostichum squamosum*, Sw. Found infrequently, and only in the swampy parts of the forests on the north side.

ASPIDIÆ.

- Aspidium (Polystichum) angulare*, Sw. To be found in all localities ; grows equally well on the mountain-sides and in the lowlands.
- Aspidium (Polystichum) angulare*, var. *falcinelliforme*. Discovered by Miss Ellen M. Taylor, author of an excellent book on Madeira, at Camacha in 1865 and at Boa Ventura in 1881. Also discovered by the Rev. John Buchanan at S. Antonia da Serra. Named by Mr. Baker at the Kew Gardens in 1875.
- Aspidium (Polystichum) falcinellum*, Sw. Peculiar to the soil ; abundant about Rabaçal, Camacha, Seixal, and S. Vicente.
- Aspidium (Polystichum) frondosum*, Lowe. Peculiar to the soil. Grows in the shady ravines near Lameçeiros, but is more common on the Montado dos Pecegueiros.
- Nephrodium (Lastrea) æmula*, Aiton. *N. Fæneseçii*, Lowe. A fragrant variety, abounding in the wooded mountainous districts.
- Nephrodium (Lastrea) elongata*, Sw. Abounds in uplands that are damp and shady.
- Nephrodium (Lastrea) Filix-mas*, Rich. Abounds in ravines above eighteen hundred feet.

Ferns

AN ALPHABETICAL LIST OF FERNS GROWING IN MADEIRA— *Continued.*

SCIENTIFIC NAME.	DESCRIPTION.
<i>Nephrodium molle</i> , Desv.	Common below eighteen hundred feet.
<i>Nephrodium montanum</i> , Baker. <i>L. Oreopteris</i> , Presl.	Rare : found only about the Lamaçeiros levada, Pico da Suna, and Pico Canario.
<i>Nephrodium (Lastrea) spinulosum</i> , Desv.	Grows abundantly in the forests, and luxuriantly at Lamaçeiros, S. Antonio da Serra, and Ribeiro Frio.
<i>Polystichum maderense</i> , Johnson.	Grows at Ribiera da Janella.

ASPENIÆ.

<i>Asplenium Adiantum-nigrum</i> , L.	Grows abundantly in the forest lands, but more luxuriantly when cultivated.
<i>Asplenium (Hemidictyon) Ceterach</i> , L.	Flourishes at Camacha and in the S. Luzia ravine.
<i>Asplenium (Athyrium) Flix-femina</i> , Bernh.	Abundant along the banks of the streams.
<i>Asplenium furcatum</i> , Thunb. <i>A. præmorsum</i> , Sw.	Found on the sides of walls and rocks in the neighbourhood of Camacha, and very occasionally in other localities not exceeding two hundred and fifty feet above sea-level.
<i>Asplenium Hemionitis</i> , L.	Luxuriant on shaded rocks at the north side.
<i>Asplenium lanceolatum</i> , Huds.	Found frequently in the walls and on the rocks above Funchal.

The Madeira Islands

AN ALPHABETICAL LIST OF FERNS GROWING IN MADEIRA— *Continued.*

SCIENTIFIC NAME.	DESCRIPTION.
<i>Asplenium marinum</i> , Huds. (Sea spleenwort).	Profuse on the rocks and in the caves of the north coast.
<i>Asplenium monanthemum</i> , L.	Common in the forests of the north side and along the banks of mountain streams.
<i>Asplenium trichomanes</i> , L.	Common along the walls of the uplands, but never growing in localities above three thousand six hundred feet.
<i>Asplenium (Athyrium) umbrosum</i> , J. Sm.	Common in the dark ravines and along the banks of running water, between the heights of two thousand and three thousand five hundred feet, its fronds often attaining a height of six feet.

BLECHNEÆ.

<i>Woodwardia radicans</i> , Sw.	One of the two most beautiful ferns of the island; its fronds often attain the height of eight feet. It grows luxuriantly in the neighbourhood of Santa Anna and is common near water-falls.
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DAVALLIÆ.

<i>Cystopteris fragilis</i> , Bernh.	Described as the brittle bladder-fern, this variety is common to marshes and to all damp localities below two thousand nine hundred feet.
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Ferns

AN ALPHABETICAL LIST OF FERNS GROWING IN MADEIRA— *Continued.*

SCIENTIFIC NAME.	DESCRIPTION.
<i>Davallia canariensis</i> , Smith.	Anglicised as hare's-foot fern, is to be found on the trees, walls, and rocks in various parts of the island. In the dry season the fronds die; but new ones take their places after the fall rains.

DICKSONIÆ.

<i>Dicksonia Culcita</i> , L'Herit.	The other of the two most luxuriant Madeiran ferns, now rare in most parts of the island, and growing in abundance only in the high but damp forest tracts of the Montado dos Peçageiros and in the uncultivated mountain regions of Seixal. The verdant, feathery leaves often rise to a height of ten feet. Pillows stuffed with the silky fibres from the base of the stems are highly prized by Portuguese grandees.
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<i>Gymnogramma leptophylla</i> , Desv.	A small, feathery fern, in foliage during only a few weeks annually, and then appearing in shady hollows and on sandstone walls in the neighbourhoods of Santo Amaro and S. Antonio. Season during March and April.
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<i>Gymnogramma Lotta</i> , Lo- weii.	Grows along the banks of mountain streams at heights above eighteen hundred feet.
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The Madeira Islands

AN ALPHABETICAL LIST OF FERNS GROWING IN MADEIRA

Continued.

SCIENTIFIC NAME.	DESCRIPTION.
GRAMMITIDÆ.	
<i>Nothochlæna lanuginosa</i> , Desv.	On old walls in and about the city of Funchal, and luxuriant in the old walls at Santa Cruz. During the dry season the fronds wither but the plants are in season during the months of February and March, and then their leaves are always green and upright.
<i>Nothochlæna Marantæ</i> , R. Br.	Uncommon, but to be found occasionally at Campanario and in the vicinity of Magdalena.
HYMENOPHYLLIÆ.	
<i>Hymenophyllum Tunbridgense</i> , Sm.	Known familiarly as the Tunbridge filmy fern. Grows in shady marsh lands between the elevations of three thousand and four thousand feet, being notably luxuriant in the neighbourhoods of Boa Ventura and S. Vicente.
LYCOPODIACEÆ.	
<i>Lycopodium complanatum</i> , L.	Rarely found, and then only in the vicinity of S. Vicente and of Encumeada.
<i>Selaginella denticulata</i> , Link.	Abundant in damp places of the higher regions, and especially in the neighbourhoods of S. Antonio da Serra and Camacha.

Ferns

AN ALPHABETICAL LIST OF FERNS GROWING IN MADEIRA— *Continued.*

SCIENTIFIC NAME.	DESCRIPTION.
<i>Selaginella Kraussiana</i> , A. Br.	Found along the banks of upland streams and on damp boulders in the vicinity of the Rib. S. Luzia.
<i>Lycopodium suberectum</i> , Lowe.	Seen frequently along the banks of Ribeiro Frio, in the neighbourhood of the Lamaçeiros water-course.

OPHIOGLOSSACEÆ.

<i>Ophioglossum lusitanicum</i> , L.	Rare, and growing only at S. Roque and Alegria. (This variety is Anglicised "adder's tongue").
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POLYPODIEÆ.

<i>Polypodium (Phegopteris) drepanum</i> , Hook.	Rare, and peculiar to the island. Found luxuriant only in the vicinity of Seixal, S. Vicente, and Ribeira do Inferno.
<i>Polypodium vulgare</i> , L.	Common to every locality.

PTERIDEÆ.

<i>Adiantum Capillus Veneris</i> , L.	Known as (and similar to American) "maiden-hair," and abundant near water-falls and in shady ravines, where it frequently attains a height of two feet.
<i>Adiantum reniforme</i> , L'Herit.	Known to the natives as <i>Feto redondo</i> , and growing on rocks and in shady ravines of the highlands.

The Madeira Islands

AN ALPHABETICAL LIST OF FERNS GROWING IN MADEIRA— *Concluded.*

SCIENTIFIC NAME.	DESCRIPTION.
<i>Cheilanthes fragrans</i> , Webb and Berth.	On old walls in and about Funchal, Santa Cruz, and Campanario. The fronds wither during the dry months.
<i>Lomaria Spicant</i> , Desv.	Known to the English as "the hard fern," and to the Madeirans as " <i>feto de pente</i> ;" it flourishes in the highlands.
<i>Pteris aquilina</i> , Linn.	Common (<i>Feteira</i> , native name; common brake, familiar name).
<i>Pteris arguta</i> , Ait.	Abundant in shady ravines.

SCOLOPENDRIÆ.

<i>Scolopendrium vulgare</i> , Sw.	Rare (<i>lingua cervirra</i> , native name; hart's-tongue, familiar name). Found near dripping water.
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CHAPTER XXII

MOSSES

Mosses peculiar to Madeira.—There are many beautiful mosses that cover the rough boulders and carpet the woodland glades at various altitudes, and the writer has gathered specimens such as he has never found or heard of as existing in any other part of the world. Among the more important works consulted by him in the course of his compilation of the names of Madeiran mosses are a reprint from the edition of Godman's book, "The Natural History of the Azores" (published by Van Voorst, 1870), and "The List of Plants found in Madeira" in Mrs. Bowdich's "Botanical Index" to her husband's valuable treatise, "Excursions in Madeira and Porto Santo" (published by George B. Whitaker, London, 1825). From these works the writer has derived considerable of his information concerning the identity of the discoverers of various varieties. The names of these discoverers will be found in abbreviation appended to the names of

The Madeira Islands

their respective discoveries, which are listed as follows :

List of Mosses.—THE MOSSES OF MADEIRA.

Amblystegium, Schimp.

Maderense.

Varium, Beauv.

riparium, Linn.

Anæctangium, Schw.

compactum, Schleich.

angustifolium.

Antitrichia, Brid.

curtipendula, Linn.

Astrodontium, Schw.

canariense, Schw.

Atrichum, Beauv.

undulatum, Linn.

Bartramia, Hedw.

rigida, De Notaris.

fontana, Linn.

Webbii.

stricta, Brid.

Bryum, Dill.

notarisii.

alpinum, Linn.

julaceum, Schrad.

atropurpureum, Web et

Mohr.

Bryum, Dill.

canariense, Brid.

pseudotriquetrum, Hedw.

capillare, Linn.

obovatum.

Campylopus, Brid.

introflexus, Hedw.

fragilis, Dicks.

azoricus.

Ceratodon, Brid.

purpureus, Linn.

Cryphœa, Mohr.

None.

Ctenidium, Schimp.

Berthelotianum.

Dicranum, Hedw.

Scottianum, Turn.

Diphyscium, Mohr.

foliosum, Linn.

Entosthodon, Schw.

templetoni, Schw.

Epipterygium, Lindb.

tozeri, Grev.

Mosses

THE MOSSES OF MADEIRA—*Continued.*

- | | |
|---|---|
| <p>Fabronia, Raddi.
 <i>pusilla</i>, Raddi.</p> <p>Fissidens, Hedw.
 <i>serrulatus</i>, Brid.
 <i>asphenioides</i>, Swartz.
 <i>pallidicaulis</i>.
 <i>viridulus</i>, Sw.</p> <p>Fontinalis, Dill.
 <i>antipyretica</i>, Linn.</p> <p>Funaria, Schreb.
 <i>hygrometrica</i>, Hedw.
 <i>fontanesii</i>, Schw.</p> <p>Grimmia, Ehrh.
 <i>trichophylla</i>, Grev.
 <i>acicularis</i>, Linn.
 <i>canescens</i>, Dill.</p> <p>Glyphomitrium, Brid.
 <i>pulvinare</i>.
 <i>polyphyllum</i>, Dicks.</p> <p>Hedwigia, Ehrh.
 <i>ciliata</i>, Dicks.</p> <p>Homalia, Brid.
 <i>subrecta</i>.</p> <p>Hookeria, Sm.
 <i>lucens</i>, Linn.
 <i>late-virens</i>, Hook. et Tayl.</p> | <p>Hylocomium, Schimp. ?</p> <p>Hypnum, Dill.
 <i>confertum</i>, Dicks.
 <i>surrectum</i>.
 <i>tenellum</i>, Dicks.
 <i>teesdalii</i> or <i>teneriffæ</i>.
 <i>pumilum</i>, Wils.
 <i>Swartzii</i>, Turn.
 <i>prælongum</i>, Dill.
 <i>longirostre</i>, var. <i>Duricæi</i>
 <i>Mont.</i>
 <i>illecebra</i>, Linn.
 <i>sericeum</i>, Linn.
 <i>mandoni</i>.
 <i>plumosum</i>, Sw.
 <i>vivulare</i>, Bruch et Schimp.</p> <p>Lepidopilum, Brid.
 <i>fontanum</i>.</p> <p>Leptodon, Mohr.
 None.</p> <p>Lescuria, Schimp.
 None.</p> <p>Leucobryum, Hampe.
 <i>juniperoideum</i>, Brid.</p> <p>Leucodon, Schw.
 <i>sciuroides</i>, Linn.</p> |
|---|---|

The Madeira Islands

THE MOSSES OF MADEIRA—*Continued.*

- Mnium**, Linn.
undulatum, Hedw.
affine, Bland.
rostratum, Schrad.
- Myurium**, Schimp.
hebridarum, Schimp.
- Neckera**, Hedw.
crispa, Linn.
intermedia, Brid.
- Orthotrichum**, Hedw.
tenellum, Bruch.
vittatum, or *Ulotia calvescens*, Wils.
- Palyteichum**, Dill.
piliferum, Schrew.
jumperinum, Willd.
commune, Linn.
formosum, Hedw.
- Physcomitrium**, Brid.
None.
- Plagiothecium**, Bruch.
sylvaticum, Linn.
- Pleurozium**, Sullivant.
None.
- Pogonatum**, Beauv.
aloides, Hedw.
nanum, Schreb.
- Pterogonium**, Sw.
gracile, Hedw.
- Pterygandrum**, Hedw.
None.
- Rhabdoweisia**, Schimp.
curvipes.
- Rhamphidium**.
purpuratum.
- Sciaromium**.
spinosum.
prolixum.
setigerum.
- Sematophyllum**.
auricomum.
- Sphagnum**, Dill.
compactum, Brid.
- Stereodon**, Brid.
cupressiforme, Linn.
canariense.
- Thamnum**, Schimp.
alopecurum, Linn.
- Thuidium**, Schimp.
tamariscinum, Hedw.
minutulum, Hedw.
- Tortula**, Hedw.
barbuloides, Brid.
brachydontia, Müll.

Mosses

THE MOSSES OF MADEIRA—*Concluded.*

Tortula, Hedw.

cirrifolia.

fallax, Hedw.

muralis, Hedw.

acuminata, Sw.

chloronotos, Schultz.

Weissia, Hedw.

controversa, Hedw.

reflexa, Brid.

verticellata, Schw.

Part VI



The Vine and the Wine



201

CHAPTER XXIII

THE VINE AND THE WINE

Introduction of the Vine.—Shortly after the settlement of Madeira the vine was brought from Crete, but it was not until the sixteenth century that the grape was cultivated to any great extent.

The largest shipments of wine from Madeira were made between the years 1788 and 1828. The following table (page 104) will serve to illustrate the progress and history of the wine product in Madeira.

The oldest and largest wine-shipping house in Madeira is that of Messrs. Cossart, Gordon & Co., established in the year 1745 by Mr. Francis Newton.

History of Good Wine as shown in the Life Work of Francis Newton.—This young gentleman started in business for himself under the most trying and adverse circumstances, for he was unfamiliar with the language and with the laws and customs, and he had the ill will of the community

The Madeira Islands

Quantity of Madeiran Wines consumed by the World, Year by Year, since 1774.—TOTAL SHIPMENTS FROM MADEIRA.

Year.	Shipments in Pipes.	Year.	Shipments in Pipes.	Year.	Shipments in Pipes.	Year.	Shipments in Pipes.
1774	7,073	1822	10,558	Financial year from July, 1850 to June,		1872	1,654
1775 } to } 1787 } Not obtainable		1823	8,083			1873	2,154
1788	10,819	1824	10,980	1874	2,060		
1789	11,762	1825	14,481	1875	2,322		
1790	13,713	1826	9,898	1876	2,568		
1791 } to } 1797 } Not obtainable		1827	8,424	1877	2,476		
1798	12,429	1828	9,623	1878	2,125		
1799	14,666	1829	8,104	1879	2,923		
1800	16,981	1830	5,499	1880	3,691		
1801	16,782	1831	5,583	1881	3,447		
1802	14,983	1832	7,163	1882	4,260		
1803	12,967	1833	8,683	1883	3,854		
1804	11,041	1834	8,875	1884	4,899		
1805	13,223	1835	7,730	1885	4,905		
1806	14,015	1836	7,913	1886	5,227		
1807	16,701	1837	8,123	1887	4,247		
1808	13,994	1838	9,832	1888	5,872		
1809	15,363	1839	9,044	1889	5,195		
1810	11,273	1840	7,976	1890	5,592		
1811	9,575	1841	7,157	1891	6,846		
1812 } to } 1819 } Not obtainable		1842	6,270	1892	5,077		
1820	13,554	1843	7,386	1893	5,168		
1821	9,916	1844	7,064	1894	5,289		
		1845	7,179	1895	5,997		
		1846	8,190	1896	5,917		
		1847	5,577				
		1848	5,829	For the regular year of			
		1849	7,879			1869	987
						1870	1,110
				1871	1,511		

N. B.—It will be understood that the years from 1851 to 1868 are all financial years of from July of the one year to June of the other. In 1869 the customs went back to the old way of keeping their books, from January to December of each year.

Statistics before the year 1774 are not obtainable.

The Vine and the Wine

for a long time because he was a Protestant, and therefore, in the eyes of the Madeiran Romanist, a heretic. But, with indomitable energy and perseverance, Mr. Newton fought every obstacle until he overcame it. His first mission was to improve the product, which, at the time of his arrival, was very large, but of inferior quality, being merely the fermented grape juice with little or no treatment. By his efforts the wine was improved, for he built warehouses, put in elaborate appliances for the manufacture of a higher grade of wine, and employed several skilled wine-makers from the grape-growing provinces of France and the German Rhine to instruct the natives in the proper handling of the product of the vine. At this time Mr. Newton was joined by several partners,—Messrs. Gordon, Cossart, Murdoch, Johnston, and Spence.

When the Wine first became Famous.—The improvement in the wine began to attract general attention, and it was not long before the price of the best product merited an advance of from twenty pounds to forty-five pounds per pipe. London became a heavy consumer, and continental cities bought largely.

The Madeira Islands

When the Demand exceeded the Supply.—The following extract from a letter sent by Newton, Gordon, Murdoch & Co., to the partner, Mr. Newton, who was in London in behalf of his business during the winter of 1801, may be of interest as serving to show the extraordinary demand that there was for the wines of Madeira at the beginning of the nineteenth century.

Extract from a Letter from Newton, Gordon, Murdoch & Co., Madeira, to Francis Newton, London, 20 January, 1810.

“There are not one hundred pipes of *old wine* in the hands of the natives for sale. The exports of the year 1800 exceeded all previous exports, being upwards of seventeen thousand pipes, and, should the demand for our wine increase as much as it has done for some years, the island will not be able to supply the requisite quantity.”

India also became a heavy consumer of Madeiran vintages. In the year 1800 Newton, Gordon, Murdoch & Co. received the following orders from Bombay alone, ordered by the following firms :

Dec. 6, 1799	500 pipes, Law, Bruce & Co.
Mar. 19, 1800	300 pipes, David Scott & Co.
Aug. 2, 1800	250 pipes, Forbes, Smith & Co.
Total	<u>1,050 pipes.</u>

FAQ-SIMILE OF AN OLD BILL OF LADING.
 (HEAVY SHIPMENT, COMPLETING ORDER FOR 500 PIRKS FOR AMERICA)

A } 80 25 10
 W }
 B } 40 25 10
 - 80 15 0 0
 D - 30 0 0 0
 P M - 0 0 0 20

165 50 100

all on board

and
 Stranded

NGE

10 11 18 18 18 18

Shipped, by the Grace of God, in good Order, and well-conditioned, by *Newton, Gordon,* and Company, in and upon the good Ship, called the *Two Ladies* whereof is Master, under God, for this present Voyage, *Wm Smith* and now riding at Anchor in the Road of *Funchal,* and by God's Grace bound for *Savannah or Charleston*

to *vs, One hundred and forty five, fifty hogheads*
(and forty two barrels equals to Two hundred of the
of Madras Wine - and also two hundred Linnons, and
some more, all for and truck of John Theobald Esq

being marked and numbered as in the Margin, and are to be delivered in the like good Order and well-conditioned, at the aforesaid Port of *San Pedro de Macoris* (the Danger of the Seas only excepted) unto *Mr. Theobald Esq* or his assigns, he or they paying Freight for the said Goods *X X X X X* with Primage and Average accustomed. In Witness whereof the Master or Purser of the said Ship hath affirmed to *3* Bills of Lading, all of this Tenor and Date; the one of which *3* Bills being accomplished, the other *2* to stand void. And for God lengthen the good Ship to her desired Port in Safety. AMEN. Dated in *Madras the 10th of June 1780*

William Smith

FA-SIMILE OF AN OLD BILL OF LADING.
 (WINE SUPPLIED TO THE NAVY)

N
1012 London
 2 *wards* *1713*

four *with* *Baron*
hops *each* *half*
boards *part* *two* *boards*
shardale *colours* *or*

boards *upon* *the*
the *boards* *damage* *might* *in* *claiming* *them*

AGI

Shipped by the Grace of God in good Order, and well-conditioned, by *Merion*,
Gordon, *Sturges* and *Company*, in and upon the good Ship, called the
Providence
 whereof is Master, under God, for this present Voyage, *J. G. Beecher*
 for *Barbadoes* and by God's Grace bound
 to say, *one* *hundred* *or* *thereby* *pieces* *of* *Wardens*
ware *by* *order* *of* *the* *Common* *Shewers* *for*
use *of* *Her* *Majesty's* *forces* *in* *the* *West* *Indies*

being marked and numbered as in the Margin, and are to be delivered in like
 good Order and well-conditioned, at the several Port of *Dover*, *London*
 (the Danger of the Seas only excepted) unto *John*, *Wright*, *Esquire*, *Merchant*
of *the* *City* *of* *London*, *or* *his* *assigns*, *or* *to* *the* *order* *of* *the* *said* *John*
Wright, *or* *his* *assigns*, he or they paying Freight for the said Goods according to
 the *Charter* *party*
 with Primage and Average accoutoyed. In Witness whereof the Master or Purser
 of the said Ship hath affirmed to *5* Bills of Lading, all of this Tenor and Date;
 the one of which *5* Bills being accomplished, the other to stand void. And
 to God tend the good Ship to her desired Port in Safety. AMEN. Dated in
West *1713*

J. G. Beecher
 Master

The Vine and the Wine

Another large order which stands in their books reads as follows :

From William Simon's Letter, dated East India House, 28 July, 1809.

“Three hundred and thirty pipes of best India Market Madeira wine. One hundred and twenty pipes best London Market Madeira. For account of the East India Company and to be shipt on board their ships of the season 1809/10.”

After one hundred and fifty years, Cossart, Gordon & Co. (the present firm name of the original Newton, Gordon, Murdoch & Co.) are still, as already stated, the leading wine-merchants.

The Responsible Wine-Merchants of Madeira.—But other responsible houses that do a considerable business in wine-making and handling are the following, alphabetically listed :

Wine-Merchants.

Araujo & Henriques.	Giorgi & Co., Antonio.
Blandy Bros. & Co.	Miles, Henry P.
Correa, J. A. (Golden Gate).	Payne & Son, John.
Cunha, A. P.	Rodrigues & Co., Francisco.
Cunha & Co.	Welsh Bros.

Vines and Stores of Cossart, Gordon & Co.—
Cossart, Gordon & Co. own vineyards here and there throughout the island. Their head-quarters

The Madeira Islands

are situated just outside the town, and comprise six distinct sets of buildings,—Estufa, Serrado, Martins, Thiago, Aula, and Pateo armazems (stores).

The Estufa Stores, where the Wines are subjected to Heat.—The estufa stores comprise a block of buildings two stories high, divided into four compartments. In the first of these common wines are subjected to a temperature of 140° F.—derived from flues heated with anthracite coal—for about twelve weeks; in the second compartment wines of an intermediate quality are heated to 130° F. for a period of some eighteen weeks; the third is for superior wines which are kept heated between 110° and 120° F. for the term of one-half a year. The “calor,” or fourth compartment, is heated by the warmth derived from the surrounding compartments. It has a temperature varying from 90° to 100° F. Here are kept the high-grade wines. The reason given for thus heating the wine is that the germs of fermentation which remain in it may be destroyed, and, moreover, that the wine will have nothing to delay its maturing, so that it may be shipped in its second and third year without further addition of spirits.

The use of this estufa in Madeira dates from the

The Vine and the Wine

commencement of the present century. The great bulk of the wine undergoes a treatment such as here described before it is shipped.

During the preparation of the following account of the wine and its manufacture the writer derived much assistance from Cossart, Gordon & Co., in Funchal, and also by recourse to Henry Vizetelly's famous book "Madeira and its Wines."

Wine-making Grapes described.—The following descriptions of the principal kinds of wine-making grapes in the island of Madeira are quoted from the above-named work.

Verdelho.—"A small oval grape, hardly as large as a coffee-berry, when ripe of a rich golden hue, full of flavour, and saccharine. The leaf of the Verdelho has seven lobes, the sinews of which are not strongly marked; it is of a dark green, but perfectly bald, and the two lowest lobes are very indistinct."

Verdelho, at the present time, is the principal wine-making grape in the island, at least two-thirds being of this species.

Tinta.—"A small black Burgundy grape of fine flavour. The leaf of the Tinta has seven lobes, decreasing in size, and the sinews are very deep and rounded; the middle lobe is subdivided into two others, both indistinct."

The Tinta grapes in smaller vineyards are usually pressed

The Madeira Islands

together with the Verdelho and other white grapes. In the larger vineyards where there may be a sufficient quantity of it to make it worth while to be plucked separately, such is done, and a red wine is made which is called Tinta, from the grape. The husks of the grapes are allowed to remain in the wine during the process of fermentation, and impart to the wine its deep-red colour and peculiar astringency. This red wine is much esteemed amongst the natives, and used as a *vin ordinaire*, being drunk in its first or second year; after that time it begins to lose its colour and character, and in course of time becomes a tawny-coloured Madeira.

Malvazia, or Malmsey.—"Malvazia Candida is a medium-sized grape, of a rich gold colour when ripe, and hangs in long, thin, pendulous bunches. The leaf has four very deep and rounded sinews with two others less distinct; each dentation has a small yellow tip; the back of the leaf is as smooth as the upper surface, and is of a deep yellow-green. Its epithet, 'Candida,' is a corruption of 'Candia,' whence this Malmsey vine was imported in the fifteenth century by the Infante Dom Henrique."

Malmsey Madeira is a rich white wine, of peculiar bouquet, imparted to the wine by the husks of the grape being allowed to remain in the wine during fermentation. It is considered one of the most valuable of the wines of Madeira, and even when young commands a high price. The best grapes are grown on rocky soil, and should be allowed to remain on the vines until they become almost raisins. The produce of Malmsey on the island is but small.

The Vine and the Wine

Bual.—"A round, straw-coloured grape of medium size, leaf with four of the sinews very deep and sharp, the two lower indistinct, the indentations sharp and irregular, the leaf hairy on both sides." The wine made from the Bual grape is of delicate and mellow character. The Bual is not a common grape, and the wine made from it always commands a high price.

Sercial.—"A round, white grape, the same as the Reising of the Rhine; the leaf has four rounded sinews; the nerves are very strong and by their projections give a cockled appearance to the leaf; it is a yellow-green and cottony on both sides." This vine will not succeed in all places or soils. It is mostly grown near the sea-coast at Paül do Mar and Ponta do Pargo, two places on the west coast of the island. The wine is very unpleasant to the palate when new, and requires some eight years to become matured. When old it is considered one of the finest of the wines of Madeira.

Malmsey, Sercial, and Bual may be considered as specialties of Madeira wines, as their production is but small and the wines are sought for only by connoisseurs.

Amongst other wine-producing grapes may be mentioned the "Negro Molle," a large, juicy, black grape, the Maroto, the Tarantrez, the Carão de Moça, Malvazia Roxa, Malvazião, the Listrão, the Bastardo, and some others. All these, however, are usually pressed together with the Verdelho species in the making of Madeira wine.

Verdelho, the King of Wine-Producing Grapes.
—All these different kinds of grapes in Madeira, with the

The Madeira Islands

exception of the specialties before mentioned, such as Bual, Tinta, Malmsey, and Sercial, are gradually giving way before the Verdelho, which is without doubt the king of wine-producing grapes.

Cossart, Gordon & Co.'s Book.—Cossart, Gordon & Co. publish a book descriptive of their establishment, and by way of describing it they quote a chapter from Henry Vizetelly's work.

Wine-making described by Henry Vizetelly.—While the writer is familiar with the plant of Cossart, Gordon & Co., he appreciates his utter incompetency to prepare an account which would be equal to that of Mr. Vizetelly. He, therefore, requotes the following from the chapter by Mr. Vizetelly as republished by Cossart, Gordon & Co.

The Serrado Stores.—The ground on which the Serrado stores stand comprises between four and five acres, with armazems of a single story occupying three of its sides, the cooperage being on the fourth. Here we observed casks being made in precisely the same fashion as is followed at Jerez, with the exception, perhaps, that the adze which the men handle so dexterously is a trifle heavier and clumsier than the one used by their Jerez brethren.

The Vine and the Wine

Coopers.—The Funchal coopers work by the piece, and each pipe, which is certainly a well-made article, costs something like a couple of pounds. Round about the cooperage were piles of American oak staves, already trimmed or in the rough, while in the centre of the plot of ground were sheds in which the casks are measured, branded, scalded, and steamed, together with a couple of large tanks.

The vacant space between the sheds and the stores is occupied with rows of casks of various sizes, fresh from the cooperage, and undergoing a seasoning with water. When this is completed the casks are transferred to the armazem de Avinhar, there to be filled with common wine, which remains in them for two or three months. In these stores there are always in use for this purpose from two hundred to three hundred pipes of wine, which after frequent employment is no longer suitable, and is distilled into spirit. In the rear of the cooperage is a dried-up watercourse, a steep ravine some forty feet deep, which intersects the town of Funchal, and is mostly bordered by an avenue of shady plane-trees.

The Season for a Freshet.—During winter the water rushes down here from the mountains,¹ bringing with it huge boulders fully a ton in weight, and sweeping away whatever it encounters in its progress.

The Flood of 1803.—In the year 1803 the rushing torrent overflowed the steep banks of the ravine, carrying

¹ Chapter XVII., A Freshet.

The Madeira Islands

away a store of Cossart, Gordon & Co.'s, which had been erected at the verge, together with several hundred pipes of wine, all of which were lost. The same flood swept away the British consulate (some distance lower down) and a church, not to speak of other damage.¹

Shade for the Labourers.—All the unoccupied ground at these Serrado stores is planted with vines trained on corridors, interspersed here and there with a mango, fig, or custard-apple tree. Trellised vines, moreover, cover in all the walks in front of the various stores, enabling the men employed in them to be always under shade. The first store which we visited—a long narrow building some three hundred feet in length, with square grated openings along its front to allow of the free admission of air—is capable of holding six hundred pipes, in triple rows of two tiers each. It is used for receiving “vinho em mosto,” or newly-made wine.

Scarlet Geraniums.—Scarlet geraniums² about a man's height are trained all over its front, and under the broad canopy of trellised vines—stretching from the roof of the store to that of the opposite shed—empty casks waiting to be “wined” are stowed away.

When the Produce of a Vineyard is purchased.—It is a common practice with the Madeira wine-shippers to purchase the produce of a vineyard before the grapes are pressed, in which case they either send some one es-

¹ Chapter XVII., Water-spout and Flood of 1803.

² Chapter XIX., Geranium.



THE VINTAGE AT BLANDY'S.

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The Vine and the Wine

pecially, or appoint an agent residing in the locality, to see that the grapes are not gathered until they are ripe, that the work in the lagar¹ is properly done, and to arrange for the transport of the "mosto" to their Funchal wine-stores. There the "mosto" continues fermenting, with the bung-hole of each cask simply covered over with a leaf, generally until the middle of November. Either before or after the fermentation a small quantity of brandy is added, varying in quantity according to the quality of the "mosto," but seldom exceeding three per cent.

Racking and Lotting of Wine.—When the wine has thoroughly cleared itself, it is racked and lotted according to its quality, and afterwards forwarded to the "estufa" or heating magazine. [A specialty with regard to the wines of Madeira of which the writer has previously spoken.²]

Fining for the Pateo Stores.—In face of the store where the mosto is received is a store for brandy; and thence we proceed under the vine-covered corridors to other stores containing wines a year old, just arrived from the "estufa,"—wines which, after having received a further modicum of spirit (varying from one to three gallons per pipe), were undergoing racking and fining preparatory to being passed on to the Pateo stores of the firm. There they will remain in butts holding four hundred gallons each, until fully matured for shipment. It

¹ Wine-press.

² This chapter, The Estufa Stores, where the Wines are subjected to Heat.

The Madeira Islands

should be noted that the mosto is fermented and the wine heated, racked, and passed from one store to another in what are termed canteiro or scantling pipes, each holding one hundred and thirty gallons, old wine measure. . . .

Where the Sun is used instead of the Estufa.—The artificially-heated estufas are used only by the larger shipping houses, who, however, heat wine in them for other shippers at a stated rate. Others accomplish the desired object by placing their wines in a kind of glass house, where they remain exposed to the full heat of the sun. In the daytime a temperature of from 120° to 130° F. is secured, which, however, becomes considerably lowered during the night, a circumstance which is regarded by many as detrimental to the development of the wine. In the country districts where estufas in no form exist, the holders of wine place the butts out in the open air in favourable positions to secure the full influence of the sun's rays.

Wine sent on a Sea Voyage to Mature.—The practice prevalent for many years past of sending Madeira on a voyage to the East or West Indies and home again is simply a variation of this method of maturing the wine by subjecting it to a high temperature, the heat which it encounters in these latitudes when shut up in the ship's hold being necessarily very great.

Precautions against Leakage under Heat.—In the estufas I am now describing—which, if packed full, are capable of heating one thousand six hundred pipes of wine at one time—the pipes are placed on end in stacks



VINE-GROWING IN THE SUBURBS.

The Wine and the Wine

of four, with smaller casks on the top of them, a narrow gangway being left between the different stacks to admit of the passage of a man for the purpose of ascertaining that the casks do not leak, as when subjected to great heat they are naturally inclined to do. A hole about the sixth of an inch in diameter has been previously bored in the bung of each pipe to allow the hot vapour to escape, otherwise the pipe would burst. As it is, the casks not unfrequently leak, as we perceive by numerous dull patches in various parts of the floor, rendering it necessary for the different compartments of the estufa to be inspected once during the daytime and once during the night, in order that any mishap of this kind may at once be rectified.

The Risky Proceeding of Tapping Wine in Air-Tight Compartments.—Each compartment is provided with double folding-doors, and after it is filled with wine the inner doors are coated over with lime, so as to close up any chance apertures. When it is necessary to enter the estufa, the outer doors only are opened, and a small trap in the inner door is pushed back to allow of the entrance of the man in charge, who passes between the various stacks of casks, tapping them one after the other to satisfy himself that no leakage is going on. On coming out of the estufa, after a stay of a full hour, he instantly wraps himself in a blanket, drinks a tumblerful of wine, and then shuts himself up in a closet, into which no cool air penetrates, provided for the purpose. Messrs. Cossart, Gordon & Co. usually place their wines in the estufa during

The Madeira Islands

the months of January and February, which admits of their removal to other stores before the next vintage commences.

Loss of Wine through Evaporation.—During the time they are in the estufa they diminish some ten or fifteen per cent. through the evaporation of their aqueous parts.

The Counting-House.—There still remain the Pateo stores to be noticed. These are situate in the rear of the counting-house of the firm, where all the books and papers relating to its transactions since its first establishment are carefully preserved.

The Pateo Stores, where Certain Specialties are kept.—Passing beneath an archway and across a narrow court planted with flowers, among which are geraniums trained level with the first-floor windows, we enter a small store, forming a kind of anteroom to the stores which follow. The first of these contains wines in butts holding four pipes each, in perfect condition for shipment, and only needing to be drawn off. Here we tasted a few specialties, including some Branco secco, made exclusively from the “verdelho” species of grape, which, having been perfectly fermented, possessed all the qualities of a remarkably fine dry Madeira; also some Sercial from Ponta do Pargo, of vintage 1865, exceedingly dry and clean-tasting, and slightly pale.

Where the Choice Wines are stored.—In the store above were wines of different qualities and ages, including some Palhetinho, or straw-coloured wine, delicate

The Vine and the Wine

in flavour and with a fine bouquet; also several still paler wines, going under the Yankee cognomen of Rainwater Madeira, on account of their remarkable softness and delicacy. Here also were stored a vintage wine of 1863,—a Vinho do Sol, as it was called, from its having been matured by exposure to the sun, and never having passed through the estufa,—and finally a pale, delicate Malmsey, of the preceding year's vintage, with a highly developed bouquet, which promised to become a wine of a singularly choice character.

The Oldest Wines.—In the armazem de Vinhos Velhissimos—the ground-floor range of building on the southern side of the courtyard—were some large butts containing reserve wine of great age and numerous soleras, including a Cama de Lobos, the origin of which dates back to 1844—a deep-coloured, powerful wine of fine high flavour, replenished from time to time by wine from the bastardo variety of grape. A São Martinho solera, dating from the year 1842, was a soft choice wine with fine bouquet, while a Bual solera going back to the year 1832 proved remarkably delicate in flavour. There were also a couple of Malmsey soleras founded respectively in the years 1835 and 1850, the former of which had all the qualities of a choice liqueur; together with a Verdelho vintage wine of the year 1851 which had never been exposed to artificial heat: a sound mellow wine of the highest character.

Flavouring and Colouring Wines of Inferior Quality.—At the end of this solera store is a store con-

The Madeira Islands

taining Surdo, or sweet wine, and Vinho Concertado, or boiled mosto, thinned by the addition of some ordinary wine, and which, like the Jerez vino dulce and vino de color, are used for flavouring and colouring wines of inferior quality.

Light, Tasty, Moderate-Priced Wine.—Proceeding through the arched passage leading into the little garden, planted with bananas, rose-trees, and geraniums, and having vines trained in corridors over the walks, we came upon another store containing wines of later vintages from the north side of the island, which are light and agreeable to drink, and are shipped at what appears to be a very moderate price.

Part VII

The Fauna

CHAPTER XXIV

ANIMALS

Rabbits. — When discovered the island contained no quadrupeds,¹ but a male and female rabbit, which were brought thereto, littered on the voyage, and their offspring when liberated on the island bred so rapidly that it was but a couple of years ere many, many thousands of rabbits coursed through the fields and underbrush.

Wild Animals.—Deserta Grande,² the largest island of the Deserta group, abounds in game, such as wild goats, wild rabbits (both originally introduced), and birds. Permission to hunt can sometimes be obtained by a personal application to the owner of Deserta Grande, who resides in Funchal, and to whom it is possible to get an introduction from either the American or the British consul.

¹ Chapter I., The Honeymoon.

² Chapter XIV., The Desertas.

The Madeira Islands

If the huntsman procures leave to shoot at Deserta Grande, it would be well for him to choose one or two trusty companions for the trip, which must be made thither in a row-boat, as no craft call there save when specially chartered. The writer had a friend who was robbed while he slept at Deserta Grande, and awoke to find that the crew in his employ had departed with the boat. It was by the merest chance that he was rescued, after a few days of exile, by a passing steamer. Another friend who started for Deserta Grande unaccompanied by friends was set upon by his crew when far out at sea. By free use of his fire-arms and fists he contrived to subdue his assailants.

The rock-bound coast of Deserta Grande contains many inlets and caverns, which are still the haunts of seals.

Cattle Raising.—After cattle were introduced into Madeira the raising of oxen became a chief industry, as they have always been used there for the conveyance of vehicles¹ in the place of horses. They are short, stockily built animals and are well

¹ Chapter V., The Carro.



THE OXEN ARE GUIDED BY THONGS, ATTACHED TO THEIR HORNS.

Animals

bred. They are guided by means of a leather thong attached to either horn, which is made sensitive by a process of tapping. From the time that the horns sprout until they are fully grown they are tapped frequently by a stick, which keeps them loose and sore to the touch. The milk of the goats is almost universally drunk by the natives, as it is quite tasteful and popularly considered more nutritious than the milk of the cows. The cows yield very little milk, and that of an indifferent quality, which is doubtless owing to the dearth of grass. As is elsewhere shown, pigs are the pets of the country-folk and are highly prized. Although the milk is indifferent, the beef is very good, and its fair quality is attributed to the floral food of which the cattle to be slaughtered partake, for, although grass is scarce, geraniums are so plentiful that geranium-fed beef is looked for in the markets.¹

Beasts of Burden.—Donkeys and small burros can be hired for an expedition at from fourteen

¹ Chapter VI., Market Value of Commodities. In Chapter XX., Trees, the juice of the papaw-fruit is described as possessing the remarkable property of making tough meat tender.

The Madeira Islands

hundred to sixteen hundred reis per day, which price includes the services of an attendant, who must needs accompany his stock in trade. In general use the pack-animals are overladen, overworked, unmercifully beaten, and generally maltreated. This is the case, as a rule, "more's the pity," in most southern and tropical countries. The national and international societies for the prevention of cruelty to animals are now making rapid strides towards establishing branches in the most remote countries and places.

Horses and their Care.—The wretched-looking pack-animals, the donkeys and the burros, furnish a striking contrast to the well-groomed oxen and the Arabian horses used in the livery-stables for riding purposes, of which the greatest care is taken. One can never hire a horse unless he be accompanied by an attendant, who runs alongside on foot. This attendant is detailed to keep guard over the rider and to see that he does not urge the horse to too great a speed nor in any way maltreat it. He carries in his hand a horse's tail attached to a short stick, and he employs this as a whisk wherewith to brush away the flies that alight upon the horse.

Animals

When the horse attains too great a speed for the attendant to keep up with comfortably, he frequently resorts to the steed's own flowing tail, to which he clings firmly while he deftly avoids the animal's heels. This action would seem to contradict his own theory regarding humane methods to be used with the steed under his charge. A distinction, however, appears to be drawn here between the cruelty which proceeds from the owner or the employé of the owner of the animal and, on the other hand, that which might be practised by an outsider.

English ladies ride a great deal, and it is the fashion among them to wear, in place of the regulation riding-habit of England, a long, loose skirt, made of some material which is light in weight and in colour. This article of apparel is donned and doffed in public in a most unconcerned manner. Indeed, it is startling to see a lady dismount in a crowded thoroughfare, loosen her belt, let her skirt drop, and step forth from its folds unblushingly. The on-looking Anglo-Saxon, whose pride it is to boast of the superior and innate modesty of his countrywomen, is relieved to find that the discarded garment is an extra overskirt, and that

The Madeira Islands

its absence still leaves its late wearer respectably clothed in a full costume.

PRICES AT WHICH A HORSE AND AN ATTENDANT CAN BE HIRED

	Reis
In Funchal and vicinity, per hour . .	400
To S. Roque or S. Martinho and return	1,000
To Camacha	1,300
To Camacha and return	1,800
To Poizo	1,700
To Poizo and return	2,400
To Cabo Girão and return	2,500
To Pico do Areeiro and return . . .	3,000
To Santa Cruz	2,300
To Santa Cruz and return	3,200
To Machico	3,000
To Machico and return	4,000
To Jardim da Serra and return . . .	2,700
To Ribeiro Frio and return	2,700
Per day	2,400
Per week	8,000
Per month	33,000

Occasionally slightly cheaper rates than the above can be found, but indifference is recommended, and time is necessary for the securing of a bargain.





THE BEACH AT SUNRISE.

Animals

Wool-Growing.—Sheep are herded in the hilly country near Funchal; but, while wool-growing has become a minor industry, mutton is not much eaten, being tough and rather tasteless.

The Domestic Fowls.—It might be here mentioned that the various domestic fowls¹ have been introduced, though this statement could be made more properly in the chapter on Ornithology.

Ducks and geese waddle about in the rippling ribeiros; chickens roost in the houses of the poor townsfolk at night, and in the daytime are tethered on the highway by a string tied to one leg and attached at the other end to a stake driven into a crevice in the cobble pavement.

Turkey-Time.—Turkeys are not much kept in the towns, but are driven thither in flocks in the early morning. The hour of their advent in the metropolis might be alluded to as turkey-time; for they are driven in great numbers through the streets, where they are offered for sale by the stentorian voices of their drivers. When a would-be purchaser appears at a door or window and points

¹ Chapter VI., Market Value of Commodities; Chapter XIII., Egg Export, MADEIRA IN 1898.

The Madeira Islands

a finger at, and makes an offer that is acceptable for, a certain bird, there is a scramble and much turkey-gobbling until the selected victim is caught. Then its neck is wrung and it is handed over to the buyer.

Business Hours.—Business hours¹ in Funchal begin early in the morning, before the roasting sun has risen high enough to glower with its perpendicular mid-day rays upon the islanders. To see the people at their busiest one must be up and on the beach by sunrise, at which time and place throngs of native boats arrive crowded with country-people, who have come by sea from coast villages near and remote to do business with the townfolk.

By five o'clock in the morning the markets are crowded, and buying, selling, quarrelling, and yelling are the principal features to be observed and heard.

Slaughter-Houses.—The slaughter-houses also are open at this early hour, and, as there are many such establishments in the town, one is constantly

¹ Chapter XIII., Gold-linked Chains as Investments and as Currency; The Commerce.



A BUTCHER AND HIS VICTIM.



THE SLACK OF BUSINESS.

Animals

being reminded of the fact when out for an early morning's stroll. Wild-looking sheep, oxen, and pigs are continually being driven by or into shabby-looking buildings, about the entrances of which are crowded eager on-lookers. The groans, growls, and screeches which issue from such uninviting places cause the visitor to hurry by in sickened disgust.

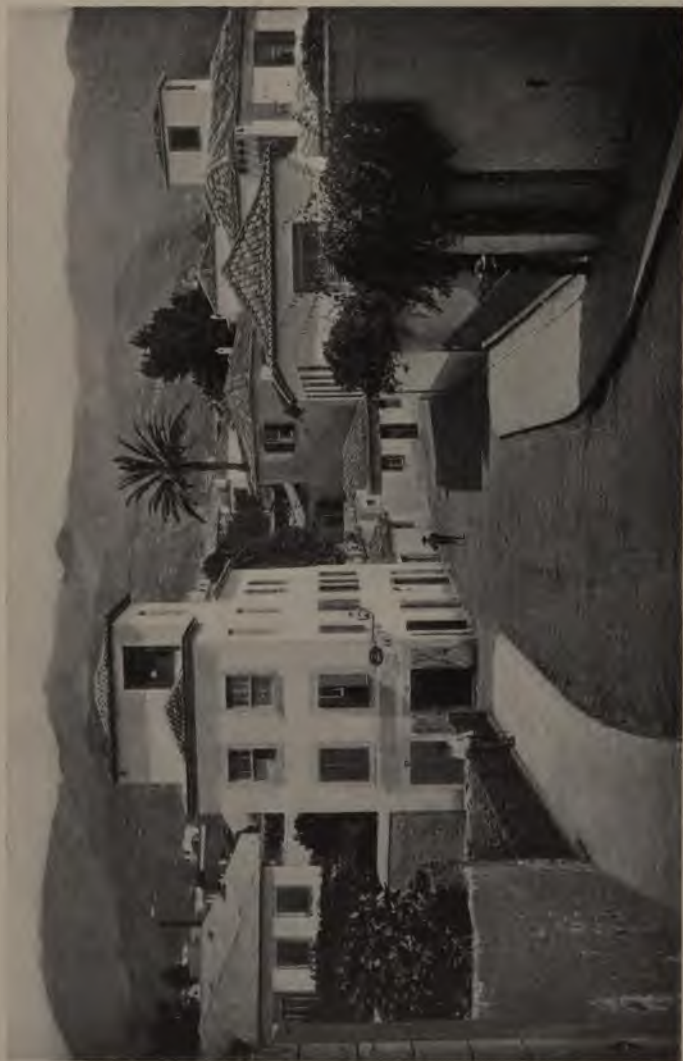
The Time for a Siesta.—The streets of Funchal continue crowded and busy until about eleven o'clock, when business is about over for the day. Between the hours of mid-day and three o'clock the streets are deserted, and the natives are to be found congregated beneath the shade of the trees in the public squares or in their gardens, lazily playing their guitars or machêtes. Others of the poorer class lie asleep on the pavements under whatever shade they can find.

The shutters of the houses are partly closed and all is silence until the sun begins to sink. Then the shutters are thrown open, the sleepers awaken, the lazy musicians cease their thrummings, and everything is *life* again.

The Time for Social Intercourse.—The late afternoons and evenings are given over to amuse-

The Madeira Islands

ment. The English people, who are great entertainers, choose these times for their lawn-parties, dances, supper-parties, lawn-tennis tournaments, informal cricket-matches, and various other entertainments of a festive character.



LAZY NOONDAY IN THE METROPOLIS.



WHERE BRIGHT-PLUMAGED BIRDS DWELL.

CHAPTER XXV

THE ORNITHOLOGY

The discoverers of the *Ilha da Madeira* found its dense forests teeming with birds of beautiful song and plumage. And, though many of the forests have long since disappeared, the winged inhabitants have remained, and the birds of song continue to drift in the sunny skies and to fill the air with exquisite melody, while the birds of gay plumage still flit through the foliage and blend their brilliant hues with the flowers and tropical greens.

The Canary. — There are thirty-one different species of birds now breeding in Madeira. Of these the wild canary deserves special mention, as it is the original of the tame songster. A stranger unfamiliar with the characteristics of this bird usually smiles incredulously when informed of this fact, remarking that the canary of the bird-cage is light-yellow, whereas the so-called canary of the island is green. And then he learns that

The Madeira Islands

this same green bird changes colour when captured and becomes the yellow canary with which he is familiar. The wild canaries are the most numerous variety of native birds.

The Petrel.—A local superstition relating to the petrel is worthy of passing mention. The country-people regard the petrel as a bird of ill omen, and believe that death follows beneath the roof of any house whereon it alights.

The Meadow Pipit.—The meadow pipit, too, is held in superstitious veneration, being regarded by the natives as a sacred bird. It utters a low call, runs swiftly, but seldom flies, and a tradition relates that it was present with the Virgin Mary at the time of the birth of Christ.

Following is an alphabetical list of the English names of Madeiran birds. The scientific and native names also are appended, together with brief descriptions of the appearance and habits of the feathered species listed.



ABOVE THE CLOUDS, WHERE THE BUZZARD DWELLS.

The Ornithology

BIRDS PROCREATING IN MADEIRA.

English Namé.	Native Name.	Scientific Name.	Remarks.
Barnowl.	Coruja.	<i>Strix flammea</i> , <i>Linn.</i>	Fond of the shade, and dwells in the darker caves and ravines.
Blackbird.	Merlo-preto.	<i>Turdus merula</i> , <i>Linn.</i>	
Blackcap.	Toutenegro.	<i>Sylvia atricapilla</i> , <i>Lath.</i>	
(Species of blackcap).	Toutenegro capillo.	<i>Curruca Heinekeni</i> , <i>Jard.</i>	A favourite pet of the natives, and is easily tamed.
Buzzard.	Manta.	<i>Buteo vulgaris</i> , <i>Leach.</i>	Frequents the mountains of the interior.
Canary, green.	Canario.	<i>Serinus canarius</i> , <i>Linn.</i>	The original stock of the yellow canary, the change in colour being the result of domesticity.
Chaffinch, buff-breasted.	Tentilhão.	<i>Fringilla tintillon</i> , <i>Webb & B.</i>	A variety peculiar to Madeira, the Canaries, and the Azores, and never found elsewhere. Frequents the highlands.
Dove, ring.	Poubo.	<i>Columba palumbus</i> , <i>Linn.</i>	A denizen of the forest country of the north side, and furnishes delicate eating.
Goldfinch.	Pinta silgo.	<i>Fringilla carduelis</i> , <i>Linn.</i>	
Gull, herring.	Gaião; gaivota after third moult.	<i>Larus argentatus</i> , <i>Brunn.</i>	Frequents the sea-coast.

The Madeira Islands

BIRDS PROCREATING IN MADEIRA—Continued.

English Name.	Native Name.	Scientific Name.	Remarks.
Kestrel.	Francelho.	Falco tinnunculus, <i>Linn.</i>	A fearless bird of prey.
Linnét, or greater redpole.	Pintaroxo.	Fringilla cannabina, <i>Linn.</i>	A plentiful variety, of brilliant, never-changing, red plumage.
Partridge, red-legged.	Perdiz.	Perdix rubra, <i>Bris.</i>	Frequents the wild mountain tracts; is wary and fleet of foot, but furnishes excellent eating.
Petrel, Bulwer's.	Anginho.	Thalassidroma Bulweri, <i>Gould.</i>	Native at the Desertas; has dark-brown plumage and two long, drooping tail-feathers. Peculiar to the Madeiras and the Canaries.
Petrel, dusky.	Pintambo.	Puffinus obscurus, <i>Temm.</i>	Breeds at the Desertas; has light-gray legs, on which it rarely stands, for it wriggles along the ground upon its belly and, being shy of daylight, climbs to hiding-places in the rocks, when darkness wanes, by aid of its bill, which it employs like a lever. It feeds on small fish and upon a few varieties of insects.
Petrel, Leach's.	Roque de Castro.	Thalassidroma Leachii, <i>Temm.</i>	

The Ornithology

Pigeon, long-toed wood.	Pombo Trocaz.	Columba trocaz, <i>Herr.</i>	A common variety, dwelling in the large trees, where the remarkable length of its middle toe (varying from two to three inches) enables it to clutch the thickest branches. It is sought by the islanders as a delicacy of food.
Pigeon, rock.	Pombinho.	Columba livia, <i>Bris.</i>	Abounds in the mountainous coast districts.
Pipit, meadow.	Corre caminho.	Anthus Bertheloti, <i>Bolle.</i>	Flocks in the uncultivated mountain regions and in the fields near the coast.
157 Quail.	Cordoniz.	Pedrix coturnix, <i>Lath.</i>	Abundant; found near the coast villages, easy to approach, and furnishes delicate food.
Redbreast.	Popinho.	Sylvia rubecula, <i>Lath.</i>	A species of thrush with a red breast.
Shearwater, cinereous.	Cagarra.	Puffinus major, <i>Temm.</i>	Seen occasionally in Madeira and abounds at the Desertas. Salted and considered a table delicacy by the natives.
Shearwater, Marks.	Boeiro.	Puffinus anglorum, <i>Temm.</i>	Breeds at the Desertas; resembles the dusky petrel in habits and appearance, excepting that it is a slightly larger bird and has white legs. Trapped and salted for food.

The Madeira Islands

BIRDS PROCREATING IN MADEIRA—Concluded.

English Name.	Native Name.	Scientific Name.	Remarks.
Sparrow, ring.	Pardal.	<i>Fringilla petronia</i> , <i>Linn.</i>	Common to the various inhabited and uninhabited localities, and nests in the crags.
Swift, common.	Andorinha do mar.	<i>Cypselus murarius</i> , <i>Temm.</i>	Contrary to its name, an uncommon variety.
Swift, lesser.	Andorinha da Serra.	<i>Cypselus unicolor</i> , <i>Jard.</i>	A numerous, dark-plumaged, cliff-dwelling variety.
Tern.	Garrajão.	<i>Sterna hirundo</i> , <i>Linn.</i>	Seen occasionally on the coast, but rarely found nesting in Madeira. Frequents the Desertas.
Wagtail, gray.	Lavandeira.	<i>Motacilla boarula</i> , <i>Linn.</i>	Nests in the neighbourhood of the ri-beiros and levadas.
Warbler, spectated.		<i>Curruca conspicillata</i> , <i>Gould.</i>	Frequents the thickets of the wild mountain districts.
Woodcock.	Gallinhola.	<i>Scolopax rusticola</i> , <i>Linn.</i>	Dwells in the western highlands and abounds in the mist-hung thickets of the lofty Paúl da Serra. Hunted at dusk by native sportsmen. Furnishes excellent food.
Wren.	Bibez.	<i>Regulus madeirensis</i> , <i>Harcourt.</i>	Characteristic to Madeira, and inhabits the wild, shrubby localities of the highlands.

The Ornithology

Although most of the information contained in this chapter was collected by the writer during his residence in Madeira, he desires, nevertheless, to express acknowledgments for assistance derived from consultation of a contribution by Mr. E. Vernon Harcourt in the *Annual and Magazine of Natural History* for June, 1855, and for aid obtained by reference to several of the works on ornithology found in the library of the British Museum.

CHAPTER XXVI

ICHTHYOLOGY

Animal-Flowers and Shell-fish.—A ramble on one of the desolate beaches at low tide¹ can furnish much instruction and enjoyment to the person with a taste for natural history, or, indeed, to any lover of nature. Then the shallow pools which are left by the receding water are filled with many sorts of queer-looking creatures: sea-anemones, with hundreds of long, squirming feelers, star-fish, sea-urchins, with long, spiky spines, that the bather should beware of, as they may cause permanent lameness when tread upon, crabs of every size and description, periwinkles, limpets, and countless other inhabitants of the “vasty deep.”

Fresh-Water Fish.—Eels are the only fresh-water fish in Madeira. They are good eating and abound in considerable variety in the mountain streams.

¹ Chapter XIV., Tide.



A BEACH AT LOW TIDE.

100

CHAPTER XXVI

ICHTHYOLOGY

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A BEACH AT LOW TIDE.

Ichthyology

Fish a Staple Food.—The natives of the poorer class in the coast districts subsist largely on fish.¹

Tunny.—Their principal sea-food is the *Peixe Atum*, or tunny, a large fish, weighing from three hundred to six hundred pounds, whose flesh is of a beefy red. The *Guelros*, or white-bait, is also relished; it is found near shore after rain-storms, when it swims in search of food into the muddy water at the mouths of inland streams.

Octopus.—*Pulvo*, or octopus, is sought after for the nourishing soup which it furnishes when boiled.²

Nearly every known species of marine fish inhabits the waters surrounding Madeira; there are few, however, that have the distinctive flavours by which we know them. This may be owing in part to the varying temperatures of the many currents swirling about the island, to the volcanic condition of the ocean bed, and to a variety of other causes.

¹ Chapter VI., Market Value of Commodities.

² Another dish is turtle-soup, Chapter XXVII.

The Madeira Islands

Best Table-Fish.—The more tasty species are John-dory, Jew-fish, sardine, salmonete do alto, mullet, and abroteas.

Marine Varieties of Fish.—Of the more numerous species of marine fish the following is a partial list:

Dog-fish	Peixe Cão
Electric fish	Torpedo
Flying-fish	Peixe Voador
Gurnard	Requieme
Herring	Arenque
Herring, Madeiran.	
Horse-mackerel, Madeiran . .	Chicharro
Jew-fish	Cherne
John-dory	Peixe Gallo
Mackerel	Cavala
Mediterranean Spet, or Pike-	
like Bicuda	Bicuda
Mullet, gray	Tainha
Mullet, red	Salmoneta
Mutton-fish	Carneiro
Needle-fish	Agulha
Rabbit-fish	Peixe Coelho
Sand-smelt	Guelro
Sardine	Sardinha
Sea-bream	Sargo
Sea-bream tribe	Pargo
Sea-fish variety	Garoupa

Ichthyology

Shark, twenty-four varieties¹	Tubarão
Sucking-fish	Remora
Sword-fish	Peixe Espada
Toad-fish	Sapo
Tripe	Dobrada
Tunny	Peixe Atum
Whirlpool-fish	Boqueirão
White-bait	Guelros
	Gaiado
	Bezugo
	Boga

¹ Chapter V., Where Sharks abound.

CHAPTER XXVII

REPTILES AND BATRACHIANS

There are no Snakes. — As Ireland is proverbially free from snakes, so is Madeira in verity. It is strange, but true, that there has never been a snake found on the island. Thus, no fear need be entertained on the score of venomous reptiles by the foreigner who would penetrate the Madeiran wilderness.

Turtles.—While the loggerhead turtle frequents the waters about Madeira, it does not breed there. It lays its eggs, and its young are hatched, on the hot sands of other tropical islands far away.

Turtle-Soup.—Madeiran fishermen catch the loggerhead when it floats asleep on the surface of the water, for its shell is useful for various purposes, and its flesh is made into a soup,¹ which, while inferior to the green-turtle soup relished by

¹ Another dish is octopus-soup; see Chapter XXVI., Octopus. .



THE VINEYARD, WHERE THE LIZARD IS DREADED.

Reptiles and Batrachians

Americans and English, is nevertheless quite edible.

A garden pet is the *Testudo græca*, a turtle that has been introduced from the African coast of the Mediterranean Sea.

Lizards.—Though in the Canaries there are many varieties of lizards, there is in Madeira but one, *Lacerta Dugésii*, and it is ubiquitous.¹ It varies from two to six inches in length, and its colour is often brown, though it is sometimes gray or black, or, again, greenish blue. It infests the island in countless millions, and, though it abates the mosquito and house-fly nuisance, it is a pest to the vine-tenders, for it often causes great havoc in the vintage season by devouring the ripened grapes. It scampers from dark crevices and basks in the sunshine. It is but seldom seen in deeply-shaded places, while the sun-baked walls and sun-bathed sides of those varieties of trees whereon the foliage grows high and casts but little shade on the trunks are covered with the small creatures.

Batrachians.—A tree-frog, *Hyla arborea*, and a water-frog, *Rana temporaria*, were introduced

¹ Chapter V., The Ubiquitous Lizard.

The Madeira Islands

about a hundred years ago and have since become characteristic. The singing of the tree-frogs in the hotel gardens in the evening takes the place of the singing of the birds in daytime, as does the croaking of the water-frogs in swampy rural districts.



WHERE FROGS INHABIT.

CHAPTER XXVIII

INSECTS

Number of Varieties of Insects.— There are about one thousand three hundred and thirty varieties of insects in Madeira ; some are to be found at the mountain-tops, some in the forest, some along the sea and cliffs, and some in the towns and houses, where they are most noticeable to the new-comer.

Spiders.—Large spiders, from an inch to two inches in length, have a tendency to attach their webs to the ceiling during the night and by means of the threads which they spin let themselves down upon the bed of the sleeper.

Tarantulas.—Along the rocks there are many tarantulas, but these, the largest species of spider, rarely go into dwellings.

The House-Ant.—There is a most annoying ant which swarms in the houses, sometimes in thousands and sometimes in millions. When they appear in such vast numbers, it is advisable to

The Madeira Islands

move out of doors until they are routed. This variety, which has been named *Æcophthora pusilla*, has been divided by scientists into four social classes,—the males, the females, the workers, and the fighters.

The Helpless Beetle.—These ants have a strong friendly regard for a certain species of beetle, which accompanies them on all their foraging expeditions; its scientific name is *Cossyphus*. It is almost blind and wingless, but its wants are carefully looked after by its friend the ant.

Cockroach and Cricket.—Other lovers of domesticity are a certain cockroach—there is another cockroach found in the fields—and a cricket with a stentorian voice. These bugs are especially fond of the kitchen, and rarely use the other rooms of the house except to exercise in after eating heavily.

Butterflies and Moths.—There are eleven varieties of butterflies and about one hundred varieties of moths. Some of the latter are very large and beautiful; most notable of the varieties is the humming-bird hawk-moth (*Macroglossa stellatorum*), which, when in flight, is frequently mistaken, even by naturalists, for the humming-bird.

Insects

Another notable variety is the death's-head hawk-moth (*Acherontia atropos*).

Beetles, Grasshoppers, and Locusts. — Madeiran beetles, unlike Brazilian beetles, are not brilliantly coloured, but have tints of black and brown. The common earwig abounds in all the islands of the Madeiran group, and a large grasshopper and a field-cricket are plentiful. There is also a scarce variety of locust.

“*Insecta Maderensia*,” an authoritative work by Mr. Wollaston, the botanist, enumerates some four hundred and eighty-three varieties of beetle.

A list of Madeiran insects, compiled by Mr. James Yate Johnson and quoted by Mr. A. Samler Brown in his excellent book, “*Madeira and the Canary Islands*,” is here given. The number of varieties and the names of the several classes to which they respectively belong are also set forth.

The Madeira Islands

List of Insects.—SYNOPTICAL LIST OF MADEIRAN INSECTS.

Scientific Name.	English Name.	Number of Varieties.
Diptera	Two-winged insects,— <i>e.g.</i> , gnats, house-fly, etc.	160
Hymenoptera	Ichneumons, gall-flies, wasps, ants, etc. . . .	217
Coleoptera	Beetles	695
Hemiptera {	Heteroptera	54
	Homoptera	14
Thysanoptera	Midges	6
Lepidoptera, Rhopalocera	Butterflies	11
Lepidoptera, Heterocera	Moths	101
Orthoptera	Grasshoppers, locusts, cockroaches, etc. . . .	19
Neuroptera	Dragon-flies, white ants, etc.	37
Trichoptera	Caddis-flies, water-moths, etc.	10
Aphaniptera	Fleas	3
Dermatoptera, Forficulidae	Earwigs	3
		—
		1331
Arachnida	Spiders	60
Miriapoda	Centipedes	4

Index

	PAGE
Accommodations away from Funchal	i. 150
Adam and Eve	i. 70
Administration	i. 221
Administration, changes in	i. 83
Adventure, a restaurant	i. 291
Adventure, a thrilling	i. 250
African question, the	i. 96
Agents, hotel, health officers and	i. 110
Aguilere, Christopher Columbus-	i. 63
Air	ii. 40
Air-holes and caverns	ii. 22
Aleppo pine	ii. 81
Alexandrian laurel	ii. 69
Along the boulevard	i. 125
America, Dr. Fructuoso a supporter of a theory regard- ing the discovery of	i. 60
American staves for wine-casks	i. 311
Americans, native friendliness for the	i. 238
Animal-flowers and shell-fish	ii. 160
Animals, wild	ii. 133
Anna d'Arfet's death	i. 40
Anna's forced marriage	i. 30
Annual celebration of the country church	i. 271
Ant, the house-	ii. 173
Apple and quince	ii. 65

Index

	PAGE
Apple, custard-	ii. 65
Areeiro, Pico do	i. 166
Aristocracy, attire of ladies of the	i. 277
Aristocracy, Madeiran	i. 247
Aristocracy viewed the ceremony, where the	i. 283
Army, the	i. 240
Arrival at the hotel	i. 130
Art-gallery in the Chapel of the Sacrament	i. 208
Art-galleries, the palatial	i. 191
Articles of native industry, dealers in	i. 305
Ash-Wednesday's parade	i. 273
Asphalt road, the	i. 321
Assassination of Governor d'Ornellas	i. 87
Associação Commercial	i. 159
Assumption, feast of the	i. 165
Asylo da Mendicidade	i. 259
Asylo, inmates of the	i. 260
Attire of ladies of the aristocracy	i. 277
Banana	ii. 62
Bankers, Blandy Brothers & Co., responsible	i. 295
Bankers, jewellers are the peasants'	i. 301
Bank-notes, scarcity of gold and silver and over-supply of	i. 300
Bank-notes, weighty coinage and bulky	i. 292
Baron Conceição, the Corn-Giver	i. 259
Baroness Conceição's, dinner at	i. 267
Batrachians	ii. 169
Bay and its shipping, the	i. 321
Bay, in Funchal	i. 105
Bay, Labra	i. 210
Bearers, how to choose the réde-	i. 173
Beasts of burden	ii. 137
Beautiful woman, Sister Clementina the most	i. 228

Index

	PAGE
Beef	ii. 137
Beetle, the helpless	ii. 174
Beetles, grasshoppers, and locusts	ii. 175
Beggars	i. 260
Behind the times	i. 244
Belgium, steamers from	i. 142
“Bella Vista,” the hotel	i. 149
Biblical customs	i. 255
Biblical days, as in	i. 195
Birds, list of	ii. 155
Bishop of Madeira, the	i. 226
Black saint, the	i. 272
Blandy Brothers & Co., letter from	i. 298
Blandy Brothers & Co., responsible bankers	i. 295
Boa Ventura, lodging at	i. 150
Boat hire	i. 148
Boating	i. 147, 207
Bombardment of the Cathedral	i. 86
Bom Jesus, Convento do	i. 227
Book, Cossart, Gordon & Co.’s	ii. 118
Boulevard, along the	i. 125
Brazil, old-fashioned topaz jewellery from	i. 300
Brazil, the late dowager Empress of	i. 182
Brazilian pine	ii. 81
Brazilian republic’s colours unrecognized	i. 96
Brazilian revolution	i. 95
Breaking of the crown, the	i. 273, 284
Breakwater	i. 113, 321
British Cemetery, the New	i. 230
British churches	i. 231
British occupancy of Madeira	i. 93
Broken glass excludes trespassers	i. 129
Broom, cactus, prickly pear, and geraniums	ii. 22

Index

	PAGE
Bual	ii. 117
Bull-fighting	i. 270
Burden, beasts of	ii. 137
Burial of natives	i. 228
Burial-ground, the Residents'	i. 229
Business hours	ii. 144
Butterflies and moths	ii. 174
Buzio	i. 217
Cabbage palm	ii. 81
Cable communication	i. 297
Cable, the first ocean	i. 94
Cabling charges to different countries	i. 298
Cabo Garajão	i. 65
Cabo Girão	i. 65, 66
Cabo Girão, second highest sea-cliff in the world	ii. 21
Cactus, prickly pear, geraniums, and broom	ii. 22
Cake, sponge	i. 156
Calhêta, monastery in	i. 213
Camphor-tree	ii. 82
Camping in the mountains	ii. 77
Canario, Pico	i. 170
Canary, the	ii. 151
Canary Islands, steamers from the	i. 140
Cane spirit	i. 307
Cannon blasts the sorrow	i. 288
Cannon, fireworks and	i. 268
Cantaria, quarries of	ii. 21
Captain Cook's sojourn in Madeira	i. 92
Carlos I., Dom, the present king	i. 95
Carlos, Dom, victory for	i. 96
Carro, the	i. 118
Casino, the	i. 200

Index

	PAGE
Casks, American staves for wine-	i. 311
Castello de Joao Battista do Pico	i. 243
Cathedral, bombardment of the	i. 86
Cathedral, erection of the	i. 84
Cathedral externally, the	i. 126
Cathedral, the interior of the	i. 278
Cathedral, the music in the	i. 285
Cattle-raising	ii. 134
Cavern, a subterranean	i. 209
Caverns, air-holes and	ii. 22
Caves	i. 207
Cayenne pepper	i. 307
Celebration of Christmas, native	i. 268
Celebration of the country church, annual	i. 271
Cemetery, the Hebrew	i. 229
Cemetery, the new British	i. 230
Cemetery, the Portuguese general	i. 229
Cemetery, the Strangers'	i. 230
Ceremony, the platform	i. 287
Ceremony, where the aristocracy viewed the	i. 283
Changes in administration	i. 83
Chapel of Santa Catarina	i. 70
Chapel of the Sacrament, art-gallery in the	i. 208
Chapel to the memory of the prediscoverers, Zargo builds a	i. 50
Character, native	i. 252
Character, the king's	i. 98
Charges in reis seem exorbitant	i. 290
Charges to different countries, cabling	i. 298
Chestnut, Spanish	ii. 81
Christmas, native celebration of	i. 268
Christopher Columbus-Aguilere	i. 63
Church, annual celebration of the country	i. 271

Index

	PAGE
Church of England, the	i. 231
Church of Santo Antonio da Serra	i. 210
Church of Scotland, the Free	i. 232
Church, the English	i. 267
Church, the Mount	i. 160
Church, the Roman Catholic	i. 226
Churches, British	i. 231
Cidrão, Pico	i. 170
Citron	ii. 62
Civil wars	i. 93
Climatic situation	ii. 35
Clouds	ii. 40
Club, Associação Commercial	i. 159
Club, English	i. 158
Club Funchalense	i. 159
Club Restauração	i. 159
Clubs and libraries	i. 158
Coast conformation	ii. 21
Cockroach and cricket	ii. 174
Coin, reis the standard	i. 290
Coinage in the provinces, lack of	i. 300
Coinage, weighty, and bulky bank-notes	i. 292
Colonists, distinguished Madeiran	i. 71
Colonization of Madeira	i. 70
Colony, the new Portuguese	i. 48
Colouring wines of inferior quality, flavouring and	ii. 129
Columbus-Aguilere, Christopher	i. 63
Columbus a resident in the Madeiras	i. 59
Columbus, courtship of	i. 58
Columbus weds Perestrello's daughter	i. 59
Columbus's house.	i. 60
Commerce, the	i. 302
Commodities, market value of	i. 158

Index

	PAGE
Communication, cable	i. 297
Concelho, Porto Santo	i. 223
Concelhos	i. 221
Condition of Madeira, unprosperous	i. 308
Coniferous trees	ii. 81
Constituição, Praça da	i. 187
Consuls in Madeira, countries having	i. 117
Convent of Santa Clara	i. 228
Convento das Mercês	i. 228
Convento de Santa Izabel	i. 227
Convento do Bom Jesus	i. 227
Conveyance, modes of	i. 117
Conveyance, the superior	i. 121
Conveyances of similar kind in other parts of the world, the rède superior to	i. 175
Cook, the	i. 119
Cook's, Captain, sojourn in Madeira	i. 92
Coopers	ii. 119
Corn-Giver, Baron Conceição, the	i. 259
Coronation of Donna Maria	i. 93
Correa, Gaspar, is put to death	i. 86
Cossart, Gordon & Co.'s book	ii. 118
Cossart, Gordon & Co., vines and stores of	ii. 111
Cotton tree, silk-	ii. 82
Counting-house, the	ii. 128
Country, farming	i. 214
Countrywomen, dress of the	i. 277
County prison the	i. 199
Courtship of Columbus	i. 58
Cricket, cockroac hand	ii. 174
Crowd, the prostrate	i. 287
Crown-bearer, the	i. 286
Crown is broken, the	i. 287

Index

	PAGE
Crown, the breaking of the	i. 273
Crowns, three, must be broken	i. 288
Curral, the Grand	i. 169
Curral, the Little	i. 166
Currency denominations and approximate equivalents	i. 299
Currency, gold-linked chains as investments and as	i. 301
Custom-house, the	i. 113
Customs, Biblical	i. 255
Dance, the Madeiran	i. 271
Danger to life, a	ii. 38
D'Arfet, the cruel	i. 29
Date of original apportionment into concelhos	i. 221
Date-palm	ii. 62, 81
D. Diniz I., the accomplishments of	i. 223
Déalers in articles of native industry	i. 305
Defensive structures, Fort Pico	i. 243
Defensive structures, Fort San Thiago	i. 243
Demand exceeded the supply, when the	ii. 108
Desert of Sahara, sand from the	ii. 37
Desertas, the	ii. 30
Dethronement of the king is advocated	i. 96
Diet for the new-comer	i. 130
Diniz I., Dom, the accomplishments of	i. 223
Dinner at Baroness Conceição's	i. 267
Discovery and naming of Porto do Seixo	i. 64
Discovery and naming of Porto Santo	i. 47
Discovery of America, a coincidence that led to the	i. 60
Discovery of Madeira, the	i. 32
Distinguished Madeiran colonists	i. 71
Districts, inhabited coast	i. 206
Divers, deep-sea	i. 108
Domestic fowls, the	ii. 143

Index

	PAGE
D'Ornellas, Governor, assassination of	i. 87
Dress for mountaineering, how to	i. 170
Dress, ladies'	i. 247
Dress of the countrywomen	i. 277
Dressmakers	i. 305
Drinking-water	i. 156
Duration of the storm	ii. 38
Egg-export	i. 317
Electric-light plant, the	i. 323
Elopement, the	i. 31
Embroidery industry	i. 318
Embroidery, Madeiran lace and	i. 302
Empress of Brazil, the late dowager	i. 182
England, steamers from	i. 136
England, the Church of	i. 231
English Church, the	i. 267
English Club	i. 158
English houses, private	i. 154
English, native dislike for the	i. 233
Enterprising natives	i. 106
Equivalents, currency denominations and approximate	i. 299
Erection of the cathedral	i. 84
Escape, a hair-breadth	i. 251
Escape, Machin's	i. 31
Escape of crew by sea to Africa, there made slaves	i. 42
Estufa stores, where the wines are subjected to heat, the	ii. 112
Estufa, where the sun is used instead of the	ii. 124
Evaporation, loss of wine through	ii. 128
Eve, Adam and	i. 70
Exchange, the official rate of	i. 163
Excursions, moonlight	i. 200
Excursions, time required for certain	i. 176

Index

	PAGE
Expedition, Zargo's second	i. 48
Export, egg-	i. 317
Export of wine to the United States, value of a year's	i. 310
Exports for the United States in 1897	i. 314
Family names to-day, best	i. 70
Famine	i. 256
Fan-palms	ii. 81
Farming country	i. 214
Father Roderigo and nine of his brotherhood, murder of	i. 85
Feast of the Assumption	i. 165
Ferns like trees	ii. 85
Ferns, list of	ii. 86
Fig	ii. 65
Fight of 1889, the	i. 234
Fighting, bull-	i. 270
Fining for the Pateo stores	ii. 123
Fire, the seven years'	i. 88
Fire-wood, kind and value of	ii. 81
Fireworks and cannon	i. 268
Fish a staple food	ii. 163
Fish, best table-	ii. 164
Fish, fresh-water	ii. 160
Fish, marine varieties of	ii. 164
Fish, shell-, animal-flowers and	ii. 160
Flavouring and colouring wines of inferior quality	ii. 129
Flood of 1803, the	ii. 119
Flood of 1803, water-spout and	ii. 57
Flowering plants, list of luxuriant	ii. 70
Flowers and shell-fish, animal-	ii. 160
Fontes de João Diniz, As	i. 195
Food, another staple vegetable	ii. 53
Food, fish a staple	ii. 163

Index

	PAGE
Forcing an entrance	i. 280
Formalities, native	i. 249
Formation, volcanic	ii. 17
Former days, landing in	i. 110
Fort, Loo Rock	i. 243
Fort, Peak	i. 243
Fort San Thiago	i. 243
Fossil bed, the	i. 209
Fountain, legend of the	i. 164
Fountains	i. 192
Fowls, the domestic	ii. 143
France, steamers from	i. 143
Freguezias	i. 221
Freshet, a	ii. 57
Freshet, the season for a	ii. 119
Frutuoso, Dr., a supporter of a theory regarding the dis- covery of America	i. 60
Fruit, varieties of	ii. 61
Fuel	ii. 81
Funchal, a ride through the streets of	i. 122
Funchal, accommodations away from	i. 150
Funchal Bay, in	i. 105
Funchal, De Montluc raids	i. 84
Funchal electrically lit by night	i. 234
Funchal, lime-kilns of	ii. 26
Funchal, poverty in	i. 260
Funchal, religious processions in	i. 272
Funchalense Club	i. 159
Furnished houses	i. 154
Garajão, Cabo do	i. 65
Garden, a public	i. 187
Gardens, hotel	i. 178

Index

	PAGE
Gardens, private	i. 129
Gardens, the new public	i. 187
Gaspar Correa is put to death	i. 86
Gateway, Varadouras	i. 196
Geranium	ii. 69
Geraniums, broom, cactus, and prickly pear	ii. 22
Geraniums, scarlet	ii. 120
German hotel, the	i. 148
German library	i. 159
Germany, steamers from	i. 142
Girão, Cabo	i. 65
Girão, Cabo, second highest sea-cliff in the world	ii. 21
Gold and silver, scarcity of, and over-supply of bank-notes	i. 300
Gold-linked chains as investments, and as currency	i. 301
Gold must be eighteen carats fine	i. 301
Government, bad	i. 239
Governor, Porto Santo's first	i. 58
Governor, relating to the	i. 191
Governors of Porto Santo, the	i. 47
Grain	i. 307
Grand Curral, the	i. 169
Grapes described, wine-making	ii. 113
Grapes, Verdelho, the king of wine-producing	ii. 117
Grasshoppers, locusts, and beetles	ii. 175
Grave of the lovers, the	i. 40, 50
Guava	ii. 61
Guide is desirable, a	i. 170
Guitarra, the	i. 263
Havoc wrought by the leste	ii. 38
Health and how to keep it	ii. 44
Health officers and hotel agents	i. 110

Index

	PAGE
Health-resort, a watering-place and	i. 310
Heat, precautions against leakage under	ii. 124
Hebrew Cemetery, the	i. 229
Heights, a table of	ii. 31
Henry, Prince, Grand Master of "The Military Order of Christ"	i. 54
Henry's parentage, Prince	i. 44
Highways, narrow	i. 125
Himalayan rose	ii. 69
Hired, how the réde should be	i. 175
Historians, the Portuguese, and their patriotic pride	i. 97
History, romance in	i. 29
Holiday crowd, a	i. 274
Holidays, frequency of legal	i. 270
Honeymoon, the	i. 35
Horses and their care	ii. 138
Horticulture, Madeiran	i. 177
Hospício	i. 181
Hospício Santa Casa da Misericórdia	i. 183
Hospital, leprosy, and the Leper	i. 184
Hotel, arrival at the	i. 130
Hotel gardens	i. 178
Hotel, Jones's "Bella Vista"	i. 149
Hotel Miles Carmo, the	i. 148
Hotel Santa Clara	i. 149
Hotel Santa Cruz	i. 206
Hotel, the German	i. 148
Hotel, the New	i. 147
Hotel, the Royal Edinburgh	i. 148
House, Columbus's	i. 60
House, the counting-	ii. 128
Houses, furnished	i. 154
Houses, private English	i. 154

Index

	PAGE
Houses, slaughter-	ii. 144
Humidity	ii. 35
Ilha da Madeira, signification of	i. 87
Ilheo d'Agostinho	i. 210
Ilheo de Baixo	ii. 26
Imports in 1897,	i. 313
Imprisonment, Machin's	i. 30
Income from Madeira, Portugal's	i. 298
India-rubber tree	ii. 82
Industry, embroidery	i. 318
Inhabited coast districts	i. 206
Inhabited islands, the	ii. 25
Insects, list of	ii. 176
Insects, number of varieties of	ii. 173
Insult, a deadly	i. 249
Interior, a view of the	i. 166
Interior of the Cathedral, the	i. 278
Invalid, the story of an	ii. 40
Invalid, warning to the	ii. 40
Invalid's lump, the	i. 293
Invention of the carro	i. 118
Investments, and as currency, gold-linked chains as	i. 301
Investments in jewellery	i. 300
Irrigation	ii. 49
Island, Morales hears of the new	i. 43
Islands, the inhabited	ii. 25
Jewellers and watchmakers, leading	i. 302
Jewellers are the peasants' bankers	i. 301
Jewellery from Brazil, old-fashioned topaz	i. 300
Jewellery, investments in	i. 300
Jewellery, wearing of	i. 248

Index

	PAGE
João Battista do Pico, Castello de	i. 243
João Diniz, As Fontes de	i. 195
Joy, sorrow turned to	i. 288
Kilo	i. 158
King and queen, natal day of the	i. 321
King! Long live the	i. 289
King's character, the	i. 98
Kings, the procession in honour of the dead and living .	i. 285
Labour, love for	i. 217
Labourers, shade for the	ii. 120
Labra Bay	i. 210
Lace and embroidery, Madeiran	i. 302
Lack of coinage in the provinces	i. 300
Ladies' dress	i. 247
Ladies of the aristocracy, attire of	i. 277
Ladies, the	i. 247
Lamaceiros Pass	i. 213
Landing in former days	i. 110
Landing, present manner of	i. 113
Laurel, Alexandrian	ii. 69
Lava	ii. 18
Law, despotic	i. 239
Lawn-tennis	i. 181
Leakage under heat, precautions against	ii. 124
Legal holidays, frequency of	i. 270
Legend of the fountain	i. 164
Leguminous plants	ii. 54
Leprosy, and the Leper Hospital	i. 184
Leste, the	ii. 36
Leste, the, havoc wrought by	ii. 38
Letter from Blandy Brothers & Co.	i. 298
Letter from United States Consul Jones to the writer . .	i. 318

Index

	PAGE
Letter from the United States Department of State	i. 309
Levadas	ii. 49
Library, German	i. 159
Libraries, clubs and	i. 158
Life at Porto Santo	ii. 26
Life of Prince Henry the Navigator	i. 54
Life, religious	i. 255
Light-house, the	i. 210
Light plant, the electric-	i. 323
Lime-kilns of Funchal	ii. 26
Lisbon by rail, from Paris to	i. 141
Lit by night, Funchal electrically	i. 234
Little Curral, the	i. 166
Lizards	i. 129, ii. 169
Local and submarine telegraph companies, offices of the	i. 297
Local steamship service	ii. 29
Locusts, beetles, and grasshoppers	ii. 175
Lodging at Boa Ventura	i. 150
Lodging at Rabaçal	i. 153
Lodging at Santa Anna	i. 153
Lodging at Santa Cruz	i. 153
Lodging at São Vicente	i. 153
Lodging at Seixal	i. 153
“Long live the king!”	i. 289
Loo, a corruption of Ilheo	i. 243
Loo Rock Fort	i. 243
Loquat	ii. 65
Loss of wine through evaporation	ii. 128
Lotting of wine, racking and	ii. 123
Love for labour	i. 217
Lovers, the grave of the	i. 40, 50
Lover's tryst, the	i. 30
Luiz I., Dom, reign of	i. 94

Index

	PAGE
Machête, the	i. 263
Machico	i. 12, 207
Machin's death	i. 40
Machin's escape	i. 31
Machin's imprisonment	i. 30
Madeira, bishop of	i. 226
Madeira, colonization of	i. 70
Madeira, discovery of	i. 32
Madeira from the sea	i. 105
Madeira, Ilha da, signification of	i. 87
Madeira is especially interesting to the world, why	i. 99
Madeira, mosses peculiar to	ii. 93
Madeira, Napoleon brought to	i. 93
Madeira, Portugal's income from	i. 298
Madeira, rediscovery and naming of	i. 49
Madeira, shipping concessions for	i. 308
Madeira, size of	ii. 17
Madeira, steamers to	i. 312
Madeira, unprosperous condition of	i. 308
Madeira, wine-merchants of, the responsible	ii. 111
Madeiran aristocracy	i. 247
Madeiran dance, the	i. 271
Madeiran horticulture	i. 177
Madeiran lace and embroidery	i. 302
Madeiran pride	ii. 69
Madeiran walk, the	i. 174
Madeiran wine consumed	ii. 104
Madeiras, Columbus a resident in the	i. 59
Madeiras, situation of the	ii. 17
Mail can be sent, rates at which	i. 295
Main post-office, the	i. 295
Malmsey or Malvazia	ii. 114
Malvazia or Malmsey	ii. 114

Index

	PAGE
Manners, good	i. 249
Map, the Medici	i. 53
Maria, Donna, coronation of	i. 93
Marriage, Anna's forced	i. 30
Marine varieties of fish	ii. 164
Market value of commodities	i. 158
Marketing	i. 156
Masonry	i. 229
May-day	i. 270
Meadow-pipit, the	ii. 152
Meat tender, papaw-juice makes	ii. 78
Medici map, the	i. 53
Mendicidade, Asylo da	i. 259
Menina, its signification	i. 58
Menina, name for an unmarried woman	i. 248
Merces, Convento das	i. 228
Merchants of Madeira, the responsible wine-	ii. 111
Meteorological observations	ii. 39
Meteorological observatory, the	i. 192
Miles Carmo Hotel	i. 148
Military Order of Christ	i. 224
Military, the	i. 286
Milk, cow's	i. 157, ii. 137
Milk, goat's	ii. 137
Molasses	i. 307
Monastery in Calhêta	i. 213
Monastery of by-gone days, a	i. 227
Monastery, ruins of a Franciscan	i. 207
Montluc, de, death of	i. 87
Montluc, de, raids Funchal	i. 84
Monument to the dead sovereign, the	i. 283
Moonlight excursions	i. 200
Morales hears of the new island	i. 43

Index

	PAGE
Morales's secret, Zargo learns	i. 44
Mosses, list of	ii. 94
Mosses peculiar to Madeira	ii. 93
Moths, butterflies and	ii. 174
Mount Church, the	i. 160
Mount sledges, the	i. 164
Mount, sledging down the	i. 163
Mountaineering, how to dress for	i. 170
Mountains, camping in the	ii. 77
Mourners, the	i. 285
Mourning is worn, how	i. 217
Mourning, the six weeks'	i. 274
Murder of Father Roderigo and nine of his brotherhood	i. 85
Museum, the	i. 196
Music and musical instruments	i. 263
Music in the Cathedral, the	i. 285
Musical instruments	i. 263, 302
Names to-day, best family	i. 70
Naming of Madeira, rediscovery and	i. 49
Naming of Porto do Seixo, discovery and	i. 64
Naming of Porto Santo, discovery and	i. 47
Napoleon brought to Madeira	i. 93
Natal day of the king and queen	i. 321
Native celebration of Christmas	i. 268
Native character	i. 252
Native dislike for the English	i. 233
Native formalities	i. 249
Native friendliness for the Americans	i. 238
Native industry, dealers in articles of	i. 305
Native orchestra, a	i. 271
Native swimmers	i. 106
Natives, burial of	i. 228

Index

	PAGE
Natives, down-trodden	i. 238
Natives, enterprising	i. 106
Navigator, Life of Prince Henry the	i. 54
New Hotel, the	i. 147
New road	i. 147, 324
New York, steamers from	i. 133
Newspapers	i. 196
Newton, Francis, history of good wine as shown in the life-work of	ii. 103
New-Years Day	i. 269
Nicknames	i. 44
Nuciferous trees	ii. 81
Nunnery, Convento das Mercês	i. 228
Nunnery, Convento de Santa Izabel	i. 227
Nunnery, Convento do Bom Jesus	i. 227
Nunnery (Convent) of Santa Clara	i. 228
Oak	ii. 81
Observatory, the meteorological	i. 192
Occupancy of Madeira, British	i. 93
Octopus	ii. 163
Officers, health, and hotel agents	i. 110
Officers of the local and submarine telegraph companies	i. 297
Omnibuses	i. 324
Ootoman's identity, Mr.	ii. 44
Opening of the sluices, the	ii. 50
Opera-house, the	i. 196
Opuntia	ii. 62
Orchestra, a native	i. 271
Order of Christ, Military	i. 224
Order of Christ, Military, Prince Henry, Grand Master of	i. 54
Palacio de São Lourenço	i. 188
Pall-bearers, the	i. 286

Index

	PAGE
Palms	ii. 81
Papaw-juice makes meat tender	ii. 78
Papaw-tree	ii. 78
Parade, Ash-Wednesday's	i. 273
Paris to Lisbon by rail, from	i. 141
Passage, the underground	i. 279
Pass, Lamaceiros	i. 213
Passos, Procissão dos	i. 273
Passport is necessary, when a	i. 117
Pateo stores, fining for the	ii. 123
Pateo stores, where certain specialties are kept	ii. 128
Paul do Mar	i. 214
Paving, street	i. 122
Pear, prickly	ii. 22
Peasantry, the	i. 255
Peasants' bankers, jewellers are the	i. 301
Peasants' household, pigs, and the position they occupy in the	ii. 53
Pedro II., Dom, dethronement of	i. 95
Pedro V., Dom, the wise and just ruler	i. 94
People, the towns-	i. 256
Perestrello's daughter, Columbus weds	i. 59
Petrel, the	ii. 152
Pico do Areeiro	i. 166
Pico Canario	i. 170
Pico, Castello de João Battista do	i. 243
Pico Cidrão	i. 170
Pico Ruivo	i. 170
Pico Torres	i. 170
Pier	i. 113
Pier, the new	i. 318
Pigs, and the position they occupy in the peasant's house- hold	ii. 53

Index

	PAGE
Pine, Norfolk Island	ii. 81
Pine-trees, varieties of	ii. 81
Pineapple	ii. 61
Pipit, the meadow	ii. 152
Plants, leguminous	ii. 54
Plants, list of luxuriant flowering	ii. 70
Platform ceremony, the	i. 287
Ponta de São Lourenço	i. 49, 210
Population	i. 221
Population, density of the	i. 316
Porta da Cruz	i. 213
Porto do Seixo, discovery and naming of	i. 64
Porto Santo	ii. 25
Porto Santo, a coincidence relative to the naming of	i. 59
Porto Santo Concelho	i. 223
Porto Santo, discovery and naming of	i. 47
Porto Santo, land-shells peculiar to	ii. 26
Porto Santo, life at	ii. 26
Porto Santo, raids on	i. 48
Porto Santo, signification of	i. 47
Porto Santo, the governors of	i. 47
Porto Santo's first governor	i. 58
Portugal's income from Madeira	i. 298
Portugal, Spanish usurpation of	i. 87
Portugal, steamers from	i. 140
Portuguese colony, the new	i. 48
Portuguese general cemetery, the	i. 229
Portuguese historians, and their patriotic pride, the	i. 97
Portuguese words	i. 88
Postage, card	i. 296
Postage, letter	i. 295
Post-office : stamp-collecting	i. 293
Post-office, the main	i. 295

Index

	PAGE
Poverty in Funchal	i. 260
Praça da Constituição	i. 187
Praça da Rainha	i. 188, 322
Prazéres, the	i. 214
Prediscoverers, Zargo builds a chapel to memory of	i. 50
Preparations against the wind-storm	ii. 37
Present king, Dom Carlos I., the	i. 95
Present manner of landing	i. 113
Prickly pear, geraniums, broom, and cactus	ii. 22
Prince Henry the Navigator, Life of	i. 54
Prison, the county	i. 199
Private gardens	i. 129
Procession in honour of the dead and living kings, the	i. 285
Processions in Funchal, religious	i. 272
Procissão dos Passos	i. 273
Produce of a vineyard is purchased, when the	ii. 120
Products, other	i. 306
Products, vegetable	ii. 50
Prostrate crowd, the	i. 287
Provinces, lack of coinage in the	i. 300
Public garden, a	i. 187
Public gardens, the new	i. 187
Quarries of Cantaria	ii. 21
Queen, natal day of the king and	i. 321
Queen, the present	i. 98
Quince, apple and	ii. 65
Quinta, Portuguese for cottage	i. 114
Rabaçal, lodging at	i. 153
Rabbits	ii. 133
Race	i. 91
Racking and lotting of wine	ii. 123

Index

	PAGE
Raids Funchal, de Moutluc	i. 84
Raids on Porto Santo	i. 48
Rail, from Paris to Lisbon by	i. 141
Railway and tramway	i. 160
Rain	ii. 38
Rainha, Praça da	i. 188
Rate of exchange, the official	i. 163
Rates at which mail can be sent	i. 295
Rebeca, the	i. 264
Réde	i. 118
Réde is carried, how the	i. 174
Réde is desirable, where the	i. 173
Réde should be hired, how the	i. 175
Réde superior to conveyances of similar kind in other parts of the world, the	i. 175
Réde-bearers, how to choose the	i. 173
Rediscovery and naming of Madeira	i. 49
Reign of Dom Luiz I.	i. 94
Reis, charges in, seem exorbitant	i. 290
Reis, the standard coin	i. 290
Relating to the governor	i. 191
Religious life	i. 255
Religious processions in Funchal	i. 272
Residence quarter, the	i. 129
Residence requirement, ticket of	i. 114
Residents' burial-ground, the	i. 229
Restauração Club	i. 159
Restaurant adventure, a	i. 291
Revolution, Brazilian	i. 95
Ribeiras	i. 166
Ribeiros	i. 166, ii. 54
Ride through the streets of Funchal, a	i. 122
Road, the asphalt	i. 321

Index

	PAGE
Road, the new	i. 324
Roman Catholic Church, the	i. 226
Romance in history	i. 29
Rose, Himalayan	ii. 69
Royal Edinburgh Hotel, the	i. 148
Ruins of a Franciscan Monastery	i. 207
Ruivo, Pico	i. 170
Ruler, Dom Pedro V., the wise and just	i. 94
Sago-palm	ii. 81
Sahara, sand from the Desert of	ii. 37
Saint, the black	i. 272
Salvages, the	ii. 30
San Thiago, Fort	i. 243
Sand from the Desert of Sahara	ii. 37
Santa Anna, lodging at	i. 153
Santa Casa da Misericordia, Hospício	i. 183
Santa Catarina, Chapel of	i. 70
Santa Clara, Convent of	i. 228
Santa Clara, Hotel	i. 149
Santa Cruz	i. 205
Santa Cruz, by steamer to	i. 205
Santa Cruz, Hotel	i. 206
Santa Cruz, lodging at	i. 153
Santa Izabel, Convento de	i. 227
Santo Antonio da Serra, Church of	i. 210
São Lourenço, Palacio de	i. 188
São Lourenço, Ponta de	i. 210
São Vicente, lodging at	i. 153
Saxifraga Maderensis	ii. 69
Scarcity of gold and silver and over-supply of bank-notes	i. 300
Scarlet geraniums	ii. 120
Scenes by the wayside	i. 125

Index

	PAGE
Schools, public	i. 126
Scotland, the Free Church of	i. 232
Sea divers, deep-	i. 108
Season for a freshet, the	ii. 119
Season for a stroll about town	i. 181
Sea-voyage to mature, wine sent on a	ii. 124
Seixal, lodging at	i. 153
Sercial	ii. 117
Serrado stores, the	ii. 118
Servants	i. 155
Settlements, first two	i. 82
Seven-years' fire, the	i. 88
Shade for the labourers	ii. 120
Sharks abound, where	i. 108
Shells peculiar to Porto Santo, land-	ii. 26
Shipping concessions for Madeira	i. 308
Shipping, the bay and its	i. 321
Shops	i. 126
Siesta, the time for a	ii. 147
Silver, scarcity of gold and	i. 300
Sister Clementina, the most beautiful woman	i. 228
Situation, climatic	ii. 35
Situation of the Madeiras	ii. 17
Six weeks' mourning, the	i. 274
Size of Madeira	ii. 17
Slaughter-houses	ii. 144
Slavery	i. 91
Slaves, crew escape by sea to Africa, there made	i. 42
Sledges, the Mount	i. 164
Sledging down the Mount	i. 163
Sluices, the opening of the	ii. 50
Snakes, there are no	ii. 166
Snow	ii. 18

Index

	PAGE
Social intercourse, the time for	ii. 147
Sorrow, cannon blasts the	i. 288
Sorrow turned to joy	i. 288
Soup, turtle-	ii. 166
Sovereign, the monument to the dead	i. 283
Spanish usurpation of Portugal	i. 87
Spiders	ii. 173
Spirit, cane	i. 307
Sponge-cake	i. 156
Stamp-collecting: the post-office	i. 293
Statistics, trade	i. 314
Staves	i. 306
Staves for wine-casks, American	i. 311
Steamer to Santa Cruz, by	i. 205
Steamers from Belgium	i. 142
Steamers from Canary Islands	i. 140
Steamers from England	i. 136
Steamers from France	i. 143
Steamers from Germany	i. 142
Steamers from New York	i. 133
Steamers from Portugal	i. 140
Steamers to Madeira	i. 312
Steamers to Madeira, regular lines of	i. 133
Steamship service, local	ii. 29
Stock-farming	i. 217
Stores, fining for the Pateo	ii. 123
Stores of Cossart, Gordon & Co., vines and	ii. 111
Stores, the Serrado	ii. 118
Stores where certain specialties are kept, the Pateo	ii. 128
Stores, where the wines are subjected to heat, the Estufa	ii. 112
Storm, duration of the	ii. 38
Storm, preparations against the wind-	ii. 37
Strangers' cemetery, the	i. 230

Index

	PAGE
Streets of Funchal, a ride through the	i. 122
Street-paving	i. 122
Stroll about town, season for a	i. 181
Structures, defensive	i. 243
Submarine telegraph companies, offices of the local and	i. 297
Subterranean cavern, a	i. 209
Sugar	i. 306
Sun is used instead of the Estufa, where the	ii. 124
Sunstroke, how to avoid	i. 130
Supply, when the demand exceeded the	ii. 108
Swimmers, native	i. 106
Tapping wine in air-tight compartments, the risky proceeding of	ii. 127
Tarantulas	ii. 173
Telegraph	i. 296
Telegraph companies, offices of the local and submarine	i. 297
Tennis, lawn-	i. 181
Throne-room, a	i. 279
Ticket of residence requirement	i. 114
Tide	ii. 25
Time required for certain excursions	i. 176
Time, the, at the Madeiras	ii. 17
Tinta grapes	ii. 113
Tobacco	i. 114, 305
Torres, Pico	i. 170
Towns-people, the	i. 256
Trade statistics	i. 314
Trade-wind, northeast	ii. 36
Tramway, railway and	i. 160
Tramway, the	i. 323
Trees	ii. 78
Trees, ferns like	ii. 85

Index

	PAGE
Trespassers, broken glass excludes	i. 129
Tryst, lovers'	i. 30
Tunny	ii. 163
Turkey-time	ii. 143
Turtles	ii. 166
Turtle-soup	ii. 166
Underground passage, the	i. 279
United States Department of State, letter from	i. 309
United States in 1897, exports for the	i. 314
Usurpation of Portugal, Spanish	i. 87
Value of a year's export of wine to the United States	i. 310
Value of commodities, market	i. 158
Varadouras gateway	i. 196
Vegetable food, another staple	ii. 53
Vegetable products	ii. 50
Veragua, the Duke de	i. 60
Verdelho, the principal wine-making grape	ii. 113, 117
Victory for Dom Carlos	i. 96
View of the interior, a	i. 166
Vine, introduction of the	ii. 103
Vines and stores of Cossart, Gordon & Co.	ii. 111
Vineyard is purchased, when the produce of a	ii. 120
Violet, yellow	ii. 70
Violin, or rebeca	i. 264
Vizetelly, Henry, wine-making described by	ii. 118
Volcanic formation	ii. 17
Walk, the Madeiran	i. 174
Wars, civil	i. 93
Watchmakers, leading jewellers and	i. 302
Water, drinking-	i. 156

Index

	PAGE
Watering-place and health-resort, a	i. 310
Water-spout and flood of 1803	ii. 57
Water-supply	i. 315
Where sharks abound	i. 108
Whitebait	ii. 163
Why Madeira is especially interesting to the world	i. 99
Wicker-work	i. 302
Wild animals	ii. 133
Wind, northeast trade-	ii. 36
Wind-storm, preparations against the	ii. 37
Wine, history of good, as shown in the life-work of Francis Newton	ii. 103
Wine in air-tight compartments, the risky proceeding of tapping	ii. 127
Wine, loss of, through evaporation	ii. 128
Wine, Madeiran, first became famous, when	ii. 107
Wine, Madeiran, light, tasty, moderate-priced	ii. 130
Wine, racking and lotting of	ii. 123
Wine sent on a sea-voyage to mature	ii. 124
Wine, value of a year's export of, to the United States	i. 310
Wine-casks, American staves for	i. 311
Wine-making described by Henry Vizetelly	ii. 118
Wine-making grapes described	ii. 113
Wine-merchants of Madeira, the responsible	ii. 111
Wines are stored, where the choice	ii. 128
Wines are subjected to heat, the Estufa stores, where the	ii. 112
Wines, Madeiran, quantity consumed yearly since 1774	ii. 104
Wines of inferior quality, flavouring and colouring	ii. 129
Wines, the oldest	ii. 129
Wool-growing	ii. 143
 Yellow violet	 ii. 70